SEPTEMBER/OCTOBER 1996

PRACTICAL WINERY & VINEYARD

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13 Cabernet Sauvignon clonal selections evaluated

19 Improving the tasting room, part IV

21 A cause of stuck fermentation

30 Making quality decisions for Oregon Pinot Noir

38 What, where, and how of sensory evaluation

61 SMART VITICULTURE

48 Professional Services SHOWCASE

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PUBLISHER
EDITOR
Don Neel

ASSOCIATE
PUBLISHER
Carol Caldwell-Ewart

PUBLISHER'S
ASSISTANT
Rebecca Parker

ART DIRECTOR
Diane Cobb

CONTRIBUTING
EDITORS
Ken Fugelsang
Eleanor Heald
Ray Heald
Glenn McGourty
Carol Shelton
Ed Weber
Bruce Zoecklein

CONTRIBUTING
WRITERS
R. Corbin Houchins
Millie Howie
Jay Conrad Levinson
Jake Lorenzo
George Schofield
Dr. Wells Shoemaker
Dr. Richard Smart
David Storm

ADVERTISING
REPRESENTATIVES

Wettstein, Nowell
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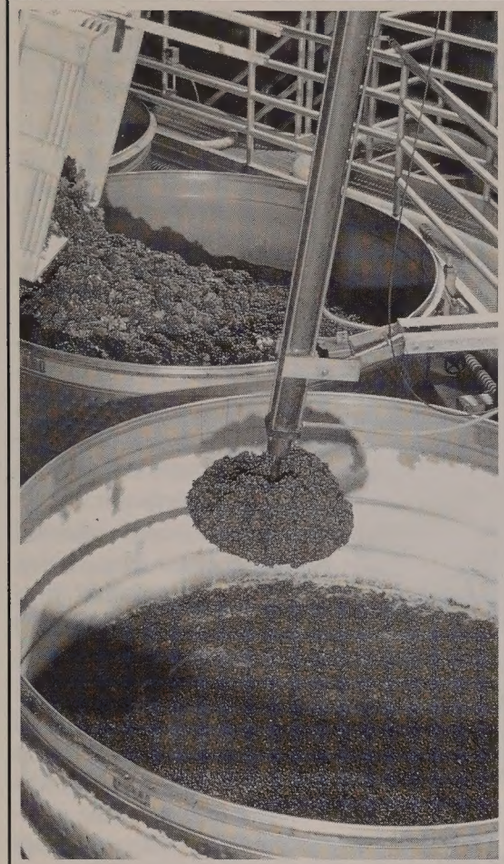
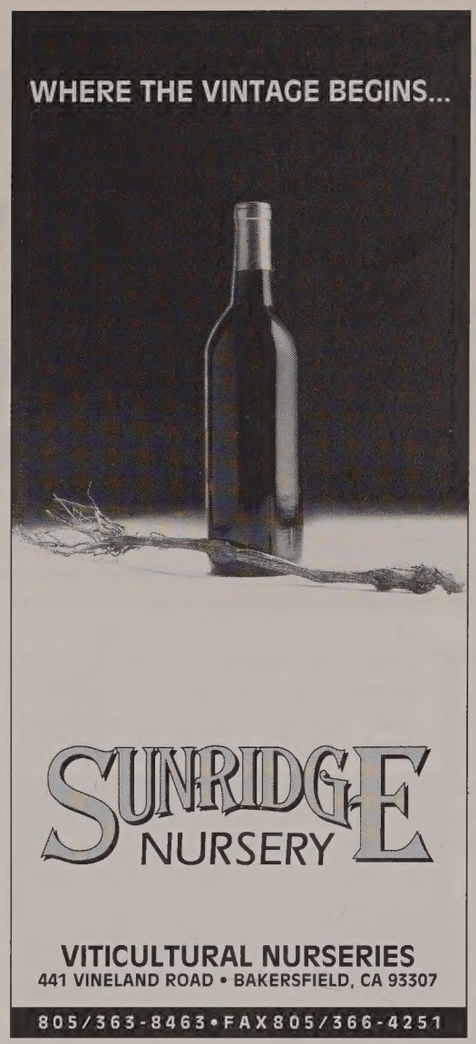
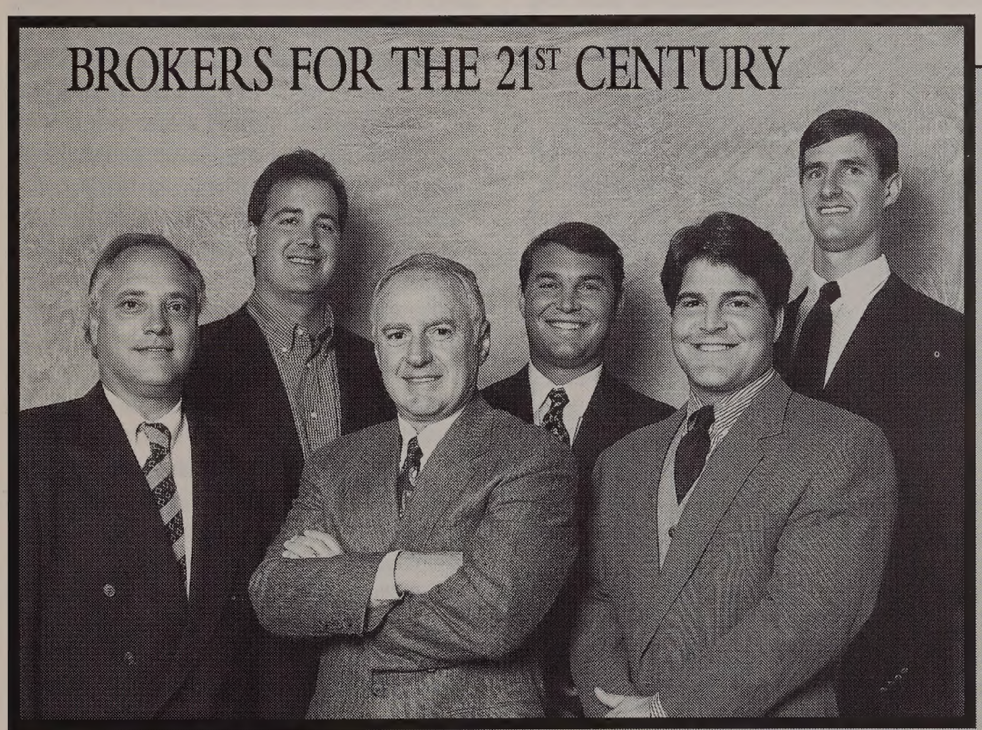


Open-top fermentation key to gentle handling

At Meridian Vineyards, Paso Robles, CA, all Pinot Noir and, depending on logistics, tiny fractions of Cabernet Sauvignon and Syrah are fermented in open-top fermenters. Punchdown is done with a manually-operated pneumatic disk three times each day. This Burgundian procedure is part of a start-to-finish effort to keep rough, overly-extracted, harsh tannins out of Meridian red wines. Pinot Noir, in particular, has a full, soft, supple feel to the tongue if it's handled gently. Meridian removes some stems, the berries get a light crushing, and following fermentation, the wine is drained off and the skins are forklifted bin by bin to the press. ■





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FETZER VINEYARDS' NEW CONSTRUCTION

Everything OLD is NEW again

by Millie Howie

Innovative design and recycled or re-used, environmentally friendly, and energy-efficient materials make the recently completed, 10,000-sq.ft. finance and administration building at Fetzer Vineyards (Hopland, CA) as new as tomorrow.

The difference between the cost of construction of this unique facility and standard construction was insignificant, according to Patrick Healy, Fetzer purchasing manager. "The interior doors were a little more expensive, but the feeling is that we were paying for exceptional quality. When you add in the special milling done to the reclaimed wood, the cost would be slightly higher. But even the 'rammed earth' walls were about the same cost as standard wood stud framing. Perhaps if suitable earth had not been available on the premises, the cost would have been considerably higher.

"As a company," continues Healy, "we are always pursing sustainable goals in all areas — from the simple recycling of waste water to this building project. Fetzer was one of the first members of 'Business for Social Responsibility,' and the concept of sustainable construction is gaining acceptance throughout the U.S.

"When we recently attended a conference on sustainable construction in Florida, there were 800 papers presented on current projects around the world. This is not something newfangled, it is just that more specifics about the techniques are now being discussed. Here at Fetzer, the impetus came from our president, Paul Dolan, with the full support of Brown-Forman (the owners.)"

The $1.2 million building is part of a $15 million construction project, moving the remainder of the Fetzer operations from Redwood Valley to join the winery in Hopland. The project also includes a 150,000-sq.ft. building to house three bottling lines, Fetzer's customer service, and the warehouse. Fetzer moved into the administration building in late spring and plans to move the warehouse and customer service groups in September and launch one bottling line in early October.

A mixture of carefully selected native soils and sands mixed with Portland cement is blown at high pressure against a one-sided wall form and around reinforcing steel bar.

Recycled materials at the heart

Details which differentiate the Fetzer administration building from other modern structures, start at the top. The roof of the new building is made of unpainted, reformulated steel from sources such as wrecked automobiles. In this formulation, steel resists rusting. The rafters, 550 pieces of 2x12x20-foot, 70-year-old Douglas fir, came from a dismantled bridge in Minnesota. Purlins and trusses, milled from Douglas fir 6x12' and 12x16' posts and beams, were reclaimed from old sawmills in Longview, WA, and Scotia, CA.

Old redwood water tanks and redwood beer tank stock were re-fabricated for the plank ceiling, soffits, and interior and exterior siding. The wood surfaces were stained with 100% water-based paint. Outside trellis material is also built from redwood tank stock, and all these wood materials were purchased from Recycled Lumberworks in Ukiah and Ukiah Redwood Sales, Willits. The lobby, entryway, and small outside patio are finished with natural slate.

Earth walls

Exterior walls for the administration and warehouse buildings are constructed of "Pneumatically Impacted Stabilized Earth," (PISE™). This is a new version of an ancient technique using rammed earth. At Fetzer, a mixture of carefully selected native soils and sands mixed with Portland cement was blown at high pressure against a one-sided wall form and around reinforcing steel bar. The impact of the mixture hitting the form compacts it, so it dries rock-hard with a strength and impermeability that will withstand thousands of years of weathering and other impacts of nature.

"The type of soil used to build an earth wall is very, very important," says David Easton, REW Associates (Napa, CA), who designed and built the walls. His company has built more than 100 rammed earth structures in the U.S. "The mix can't contain an overabundance of clay or rock. We always prefer to use soils from the bio-region in which we are working, so we did extensive investigation around the Fetzer property to find the right soil for the job. We try to hold the clay content to about 10%, otherwise, it will not set up well. Fetzer soil had a little too much clay, so we added sand from the local river bank."

These earth exterior walls eliminate the need for wood framing, and with their effective R-50 insulation value, they require no additional wall insulation. Between 18 and 24 inches thick, they

moderate the interior temperature so well that there is no need for air conditioning and little need for heating. Very like well-lit caves, rammed earth structures are fireproof, rot proof, and termite proof. They're nearly soundproof as well.

"PISE is the best economical value for wine production and storage," says Easton, comparing his new technology with traditional construction methods. "Concrete block and concrete tilt-up construction both need insulation and cosmetic treatment before they're complete. With PISE, when the forms come down the wall is finished. When you consider the extra steps needed with concrete block or tilt-up construction, PISE is less expensive and its thermal insulation value is better." He says the technology is so new that energy savings hasn't been calculated in wineries, but in residential settings, PISE saves about 50% of energy costs over traditional construction.

Easton's company has built rammed earth bottling and case storage buildings for Haywood Winery (now Ravenswood in Sonoma, CA) and Chathom Vineyards (Murphys, CA). The company used the PISE method to build Long Meadow Ranch Winery (St. Helena, CA).

Non-toxic and energy-efficient

In place of more traditional fiberglass ceiling insulation, Bill Booth, Fetzer's building project manager, chose Miraflex from Owens Corning, which does not exude gases, since it is made without chemical binders or colorants. An additional consideration for Booth, in choosing this material, as well as natural linoleum and wool carpeting, was the low "embodied energy" rating. This rating addresses the amount of energy products consume before they reach the building site — the energy needed to extract the resources, manufacture the products, transport them between various phases, and to install them.

Built-in cabinets were also constructed of materials that exude no volatile gases — hardwood hackberry veneers applied to substrates made from wood scrap.

The project also re-used materials. Fetzer salvaged handsome oak doors, dating from the 1920s, from a razed Pacific Gas & Electric (PG&E) building in San Francisco and rescued desks and office partitions from a salvage yard.

Designed to save energy

Larkin & Associates, Mechanical Engineers (Sebastopol, CA), developed the building's energy design, which considers all relevant functions, including architecture, heating, cooling, ventilation, lighting, automatic controls, and furnishings. The building depends on nature for most of its light and heat, with minimal assistance from man. Developed for use in Canada's cold climates, the window system has fiberglass frames, is glazed with insulated glass, and has a "heat mirror," which retards the flow of out-going heat in winter and in-coming heat during summer.

Lighting was modeled and tested at a PG&E energy design center. Clerestory

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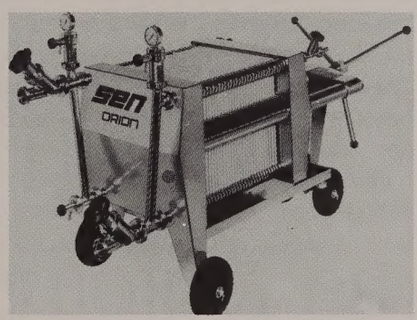

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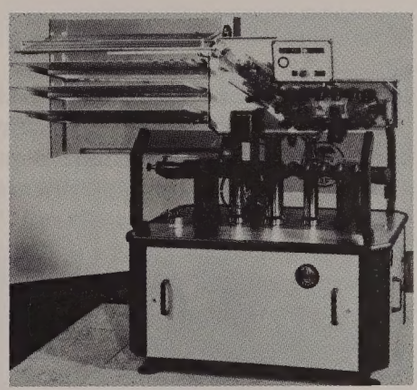
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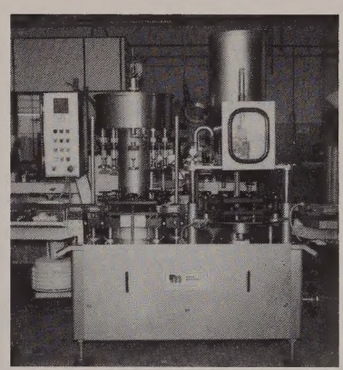
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windows, light bouncing surfaces, light-reflecting louvers, and placement of interior windows and openings combine to move usable natural daylight into the farthest corners of the building. Light fixtures, made of the same recycled steel as the roof, are controlled by sensors which turn the lights off when there is enough available natural light or the space is unoccupied. Fetzer employees can frequently work comfortably throughout the daylight hours without turning on any lights.

Most of the building's heating needs are met by passive solar heat. A gas boiler provides back-up heating through hot water coils in the ducting to each zone. Windows can be opened, but since fresh air is always being supplied whenever the forced air system is operating, it is not usually necessary to open windows at all. Hot water needs are served by small, "point-of-use" water heaters in the washrooms.

A computerized control system monitors indoor and outdoor conditions and schedules appropriate heating, ventilating, and air conditioning. The building is automatically cooled each night with gravity fan, forced ventilation. When additional cooling is necessary, cooling coils connected to the winery's large glycol tank cooling system nearby or coils cooled with water diverted from the winery's on-going operations may be used. Computer calculations project that the new building's total annual energy use will be approximately 43% below the California state energy code's standard for new office buildings.

Recouping construction costs

Thanks to these energy-efficient lighting, heating, and cooling systems, Fetzer is eligible for PG&E rebates totaling about $25,000 on the $15 million project. "While the building is much more energy-efficient," says Healy, "and we know that any extra cost will be recaptured in a short time through energy savings, we don't have any exact figures yet." ■

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How to be a good PATRON (boss) with Hispanic employees

by Trula M. LaCalle, Ph.D.

Basic management courses are quick to emphasize the need for cross-cultural management styles which adapt to a diverse workplace. Most instruction fails to zero in on the specific management skills needed to be effective with Hispanic employees, however, especially with Hispanic immigrant employees.

The California wine industry relies heavily upon Hispanic employees, primarily Mexican nationals and Mexican-Americans, to work in the vineyards and the cellars. The industry has a strong need for management training which emphasizes cross-cultural communication and leadership skills. Contemporary management techniques are often ineffective with Hispanic workers.

Hispanic cultures value hierarchy, tradition, formality, and respect

For example, today's management gurus emphasize flattening the hierarchy and supporting self-directed work teams. This approach works well for independent-minded employees whose culture values individual achievement and personal autonomy. It doesn't work well with employees for whom hierarchy is the proper way to organize a business, such as those from Mexico.

In a hierarchy, leaders are assumed to know better than the workers, and therefore, the leaders deserve their recognized power. Appropriate deference is readily given to superiors. Clear lines of authority make work flow smoothly and predictably, and predictability provides necessary security.

This decade in the business environment has thrown predictability out the door. "Change management" is the key issue among most U.S. organizations. Emphasis on change, variety, and creativity go counter to the values of history and tradition in the Hispanic cultures.

The Hispanic worker wants to know how things *have been* more than how things will be. "This is the way things have always been done" is a powerful and positive directive to these employees rather than an invitation to challenge the status quo. For the Hispanic worker, clear rules, norms, and protocol are important to know and to follow.

Non-Hispanic managers become frustrated with the immigrant Hispanic's need for clear, specific, and repeated directives. "I seem to have to tell him every time" is the common lament. But the dedicated immigrant Hispanic worker expects to be told what to do. Then he or she can do exactly what is expected in order to satisfy the boss.

The way to please one's employer, in the Mexican culture, is not through independent thinking but through behaving in a manner that is highly compliant with the wishes of the employer.

Managers in Hispanic cultures are expected to be formal with their subordinates. Non-Hispanic, North American managers often try to build rapport with their workers by approaching them informally and talking "on their level." Such behavior often confuses Hispanic employees, especially those who are not yet accustomed to American manners. In their countries of origin, behavior from superiors which is too informal is seen as uneducated, improper, and even disrespectful. Proper Hispanic managers in Mexico, for example, would sincerely inquire into the health and welfare of a worker's family, but would not invite this discussion in a way which made the two of them to appear to be friends.

Motivating with respect and opportunity

Being a good boss, *jefe* or *patron*, means taking good care of your workers' needs, treating them with respect, and allowing them opportunities to advance. In return, the boss will retain loyal, respectful, hard-working employees. The equation sounds simple, but for many employers it is not.

Naturally, Hispanic workers, like all other employees, desire fair pay, benefits, and reasonable working conditions. Human resource departments are dedicated to addressing these issues. What management often overlooks are the intangible motivators — respect and opportunity.

Among Hispanics, dignity and respect for the individual is inherent and not earned. For Hispanics, to be human or *ser humano* is enough to merit respect. Even the word "respect" or "*respecto*" carries a different connotation and is more emotionally laden. In Spanish, *respecto* is personal.

In the culture of the U.S., an abrasive reprimand from a boss is taken seriously, but employees are likely to look beyond the reprimand to the greater context. Was the boss having a bad day or under unusual pressure?

Non-Hispanic workers look for ways to reduce their emotional distress by reasoning that the incident was not to be taken too personally. Hispanics find such behavior on the part of a manager highly unacceptable and are less forgiving of a boss who loses control and speaks disrespectfully to them. Such a reprimand is taken personally. If it occurs in the presence of a co-worker, the reprimand becomes an extreme affront to the dignity of the worker.

Hispanic vineyard workers and cellar employees welcome the opportunity to earn more and have greater status in the organization. Managers who offer training opportunities and who reward the acquisition of new skills will be seen as caring and concerned for Hispanic employees.

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In California, the high school drop out rate for Hispanic adolescents is 40% or more. Immigrant Mexicans often have an educational level equivalent to the sixth grade or lower. Their opportunities for formal education are thwarted by complex social and economic factors. Therefore, on-the-job training can be a very good employee incentive.

Creating successful supervisors

When line workers are promoted to supervisory positions, they often need training. Too often, a hard-working, bilingual line worker is promoted without sufficient consideration for supervisory skill and without supervisory training. The non-Hispanic manager may not understand why the newly promoted supervisor is now standing back and watching the work of others while doing little or no hands-on work himself. In Mexico, a supervisor is supposed to oversee the work of others rather than do the work himself.

Just as the non-Hispanic supervisor needs training in cross-cultural issues, the Hispanic supervisor requires an understanding of the two cultures in the workplace also.

Specifically designed, in-house management training courses on how to work effectively with Hispanic employees are more likely to meet wine industry needs than generic management courses about diversity. Such training is a small investment for an immediate and long-term gain. A culturally aware and culturally responsive manager or supervisor will retain good Hispanic employees and increase the productivity of all his or her Hispanic workers. ■

Trula M. LaCalle, Ph.D. is a human relations and management consultant living in Sonoma County. Spanish is her second language. She is married to an Hispanic and has 25 years experience working with Hispanics from various Latin American countries. Her background in psychology lends unique insights to her training presentations and consultations. She can be reached at 707/577-9367 or lacalle@metro.net.

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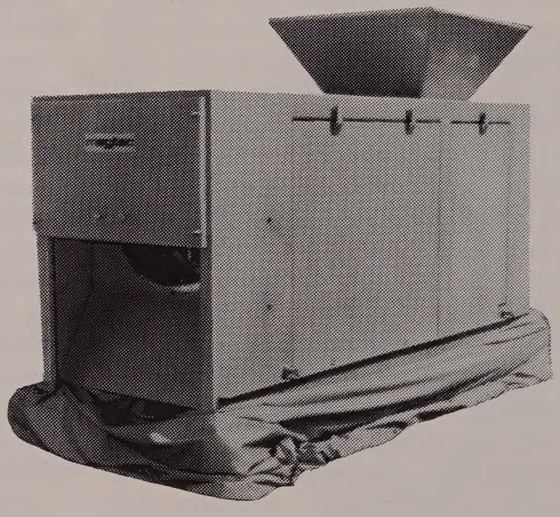

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SEMINARS:

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Speakers: Don Gordon, VESTRA Resources, Inc.; Daniel Bosch, Robert Mondavi Winery.

Geographical Information Systems (GIS) computer software provides a powerful tool for tracking information about vineyards and showing patterns that might not otherwise be apparent. Powerful spatial analysis can be accomplished by overlaying data maps of vineyard blocks indicating yield, pruning weights, soil type, rootstocks, trellising, nutritional levels and clones, as well as remotely sensed data such as digital imagery. This seminar will provide an introduction to GIS and show examples of how it has been applied in vineyard management.

Eutypa Dieback and Oak Root Fungus

Speakers: Dr. Doug Gubler and Dr. David Rizzo, UC Davis Plant Pathology Dept.

Eutypa dieback and oak root fungus are common in vineyards throughout much of California. Eutypa dieback is likely to be a serious threat to recently planted vineyards in the North Coast. New research efforts to better understand and control these two diseases will be discussed.

Admission is $3 per person.

For more information, contact:
Napa Valley Grape Growers Association, 707/944-8311.

1996 Sitevinitech

Sitevinitech will open its doors on December 3-6, 1996 in the Bordeaux Parc des Expositions in Bordeaux, France. More than 500 companies will exhibit equipment and techniques for grape-growing and wine and spirits production.

The exhibition will be of interest to viticulturists, enologists, and wine sellers. In 1994, 42,000 visitors attended (4,000 were from 41 different countries).

The exhibition has four sectors:

• Viticulture equipment includes tractors and other machinery, soil maintenance, seeding and planting, fertilizing equipment, phytosanitary equipment, vine maintenance and sizing, and harvesting. Viticulture products and accessories include: phytosanitary products, fertilizers, plastics, and other intermediary products.

• Viniculture equipment includes: transportation, maintenance, receiving of the harvest, pressure-treating and handling, vats and related equipment, vine and wine handling, analysis and laboratory equipment. Wine production products include: maintenance, cleaning, vat maintenance, and preservation.

• Bottling/labeling/shipping includes: cleaning and sterilization, bottling, sealing, casing, handling and stocking of wines, handling and stocking of bottles. Also bottles, containers, closures, and bottle packaging.

• Miscellaneous products and other services include: training or research centers, computerization, software, maintenance, hygiene, and trade press.

Exhibitors come from France, Germany, Italy, Spain, Portugal, Austria, and Switzerland. In the 1994 Sitevinitech, there were more than 950 exhibitors (26% were non-French).

A conference program with contributions from associations and viticulture cooperatives has been prepared to make Sitevinitech a key site for debate. Major themes include: packaging norms, information technologies (computer-based quality control), wood and spirits (technical and taste aspects, marketing), security, harvesting machines, and spraying techniques (packaging and phyosanitary waste treatment).

Sitevinitech will also host the 10th Euroviti Colloquium, organized by the Institut Technique du Vin, on Wednesday and Thursday, December 4-5. The Colloquium will focus on four areas: vineyard security, viticulture, economy, and

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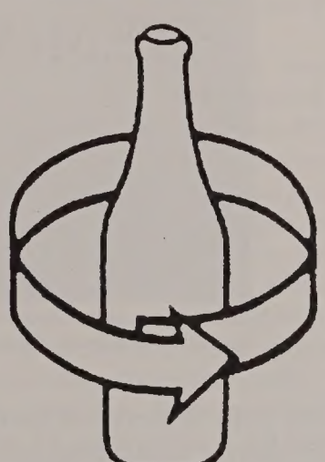

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enology. In 1994, 2,100 people attended (half were wine grape growers and the other half were professionals in the wine-producing sector).

Euroviti presentations will include: "Soil maintenance: Influence on grape production and the enological consequences" presided over by J. Delas (INRA, Bordeaux) and moderated by Ch. Riou (ITV, Angers). "Grape-Moths: How to win the battle" will be presided over by Professor D. Boubals and moderated by T. Coulon (ITV, Bordeaux). "Prefermentation macerating techniques in red wine production: Its value, limits, and possibilities" will be presided over by Professor Pascal Ribereau Gayon (Enology faculty, Bordeaux) and moderated by J.L. Berger (ITV, Rhone-Mediterranée). "Vines, Wines, and Innovation: Is innovation worthwhile for the viti-viniculture sector?" will be moderated by P. Rouquie (ITV, Paris).

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Members of the Committee for the Promotion of Innovations, who select "Innovation Oscars," come from the scientific services of the CEMAGREF, the Bureau Commun de Technologie et d'Oenologie, ITV, INAPE, MSA, the Union des Oenologues, the National Institute for Bottling, ENSAM, SYGMA, the Enology Department of the Bordeaux, and Sitevinitech.

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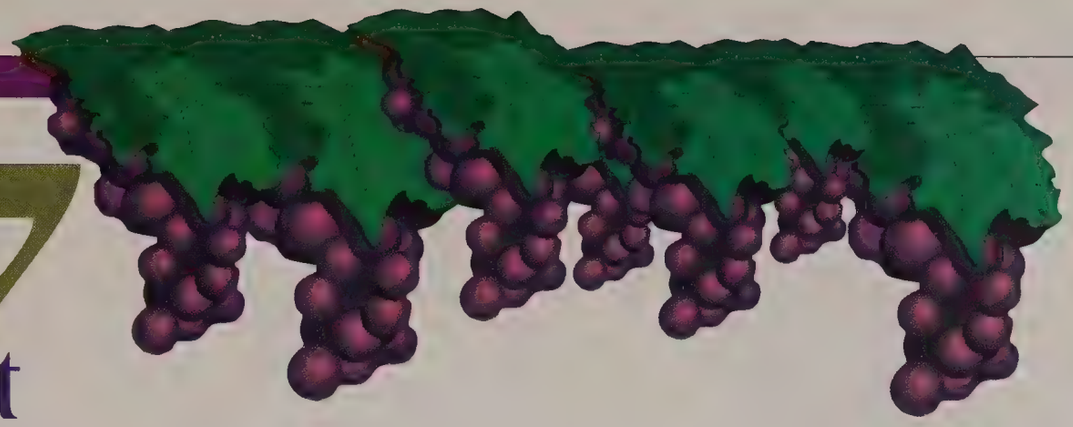

7 Cabernet Sauvignon clonal selections EVALUATED

by James A. Wolpert,
Amand N. Kasimatis,
and Paul S. Verdegaal

Introduction

Winegrape clones have not been extensively evaluated in California. Early selection work by C.J. Alley,[1] H. Olmo (unpublished data), and A. Goheen (personal communication) resulted in the current collection of virus-tested clones in Foundation Plant Materials Service (FPMS). However, release of these certified selections was generally not accompanied by publication of viticultural or enological attributes.

A present-day effort to characterize differences among selections of several cultivars was initiated by University of California specialists and farm advisors in locations throughout California.[11] In an earlier report from this group, Chardonnay clones were found to differ significantly in such factors as yield components, fruit maturity indices, and pruning weights.[12]

Cabernet Sauvignon acreage is second only to Zinfandel on California's list of important red winegrape cultivars, having increased from 16,500 acres to 34,600 acres in the past 10 years.[8]

The field performance of seven Cabernet Sauvignon clones in the Lodi-Woodbridge district of California's northern San Joaquin Valley is reported below. Analyses of wines made from these clones will be presented in a separate paper.

Comparisons in previous trials in Australia, France, and California

Clonal research on Cabernet Sauvignon is an active area of research, especially in Australia and France.

In a comparison of Cabernet Sauvignon selections from Australia, France, and the U.S., J.R. Whiting and W.J. Hardie found significant differences in yield components and fruit maturity indices.[9] In the five-year study, the sole U.S. selection, G9V7 (FPMS 7) had an average yield of 33 lbs/vine, three times that of the lowest yielding selection (11 lbs/vine) from Pont-de-la-Maye, France. The authors attributed the yield differences primarily to the number of clusters per vine.

In another Australian study, ten Cabernet Sauvignon clones ranged in average yield from 6.8 to 11.7 lbs/vine.[5] The sole California selection, FPMS 7, was among the highest yielding at 10.8 lbs but was the least preferred in wine tastings.

R.M. Cirami[3] and Cirami *et al.*[4] reported on several Cabernet Sauvignon clonal trials in South Australia, where the lowest yielding clones were generally about half that of the highest. Great differences were seen among the experimental sites, where yields on average ranged from 11 lbs/vine to 33 lbs/vine.

In Bordeaux, yield per vine of Cabernet Sauvignon clones varied by a factor of two, from 2.6 lbs to 5.3 lbs/vine (J.P. Doazan, personal communication). The lower yields per vine in this trial were likely due to much closer spacing than in vineyards in the Australian studies.

In California, P.A. Bowen and W.M. Kliewer reported that significant yield differences among three Cabernet Sauvignon clones were due to components such as clusters per shoot and fruitset (number of berries per 100 flowers).[2]

Lodi trial

The purpose of this trial was to compare all unique Cabernet Sauvignon selections available in 1984 from Foundation Plant Materials Service (FPMS) for performance in the Lodi-Woodbridge district, an area where varietal wine production is increasing in importance.

The trial was located three miles east of Woodbridge, CA. Vines were planted on a 7ft. x 11ft. (vine by row) spacing (566 vines/acre).

A two-wire trellis was employed, with the lower wire at about 42 inches and the upper wire at about 60 inches. Vines were trained to a bilateral cordon on the lower wire and spur-pruned to 18 two-node spurs per vine. The vineyard was clean cultivated by means of discing the row middles, and contact herbicides were used in addition to row plowing to prevent weed growth in a two-foot strip under the vines.

The area has been reported as a Region IV, with about 3,700 heat units (base 50°F),[10] although average heat summation typically varies between a high Region III and low Region IV with equal frequency. Supplemental irrigation was provided by furrow irrigation until 1990 when a drip system was installed.

For the years 1990-1992, winter rainfall was 11.8 inches, 9.8 inches, and 16.3 inches, respectively. Typically, at veraison, four inches of irrigation were applied followed by a another four-inch application after harvest. The

exception was in 1990 when an additional three inches were applied in July.

The trial was established in spring 1984 as a planting of certified Harmony rootings which were field-budded to Cabernet Sauvignon clones in late summer. Budwood was taken from certified, virus-tested clones at FPMS, University of California, Davis (Table I). The trial was located within a Cabernet Sauvignon vineyard operated by the Robert Mondavi Woodbridge Winery. Cultural practices were typical for area Cabernet Sauvignon vineyards.

Data were taken over a five-year period beginning in 1988; however, data are shown only from the final three years (1990-1992). The trial was harvested on a vine-by-vine basis, clusters were counted and vine crop weights measured.

Prior to harvest, a 100-berry sample was taken per treatment replicate. Berries were weighed, then crushed, and juice was filtered through cheesecloth. Soluble solids were measured as °Brix by means of a hand-held, temperature-compensating refractometer. Juice pH was measured by electronic pH meter. A juice aliquot was titrated with 0.1 *N* NaOH to pH 8.2 endpoint to determine titratable acidity.

Table I
Foundation Plant Materials Service (FPMS, Davis, CA) clone numbers, sources and heat treatment days of Cabernet Sauvignon materials.

FPMS Clone #	Source[z]	Heat Treatment (days)
2	Oakville 11V1	0
4	PI 296424 Mendoza, Argentina	0
5	PI 296435 Mendoza, Argentina	0
6	Jackson, CA G8V10	0
8	WAK3V15, Concannon 34V2	168
10	PI 258587, Neustadt, W. Germany	148
21	PI 364302, Cachapoal, Chile	141

[z]PI = Plant Introduction number

Results

Data were summarized as three-year averages for all measured values (Table II); complete data can be found in Wolpert et al.[13] On average, pruning weight was greatest in FPMS 6 and lowest in FPMS 8 and 10. Although significant differences in amount of growth were seen among years, relationship among clones was similar each year.

Yield was greatest in FPMS 21 (21.3 lbs/vine) and least in FPMS 6 (15.4 lbs/vine). The resultant average yield-to-pruning weight ratio showed three groupings: FPMS 6 at about 2.5, FPMS 2, 4, and 5 at about 3.5 to 4, and FPMS 8, 10, and 21 at about 4.8 to 5.2.

Cluster number did not differ consistently among clones. Cluster weight differed greatly among the clones with the lightest being FPMS 6 (69 g) and heaviest being FPMS 8 (100 g).

On average, FPMS 6 had about 20 fewer berries per cluster than the remainder of the group but in any one year the range among clones could be substantially greater, e.g. from 75 to 111 (data not shown). Berry weights were greatest in FPMS 8 and 21 and lowest in FPMS 2, 5, and 6.

Differences in fruit ripening were mainly confined to °Brix where the lower yielding clones (FPMS 5 and 6) were among the earliest maturing, and the higher yielding clones (FPMS 8 and 10) were among the latest maturing. No difference in titratable acidity was detected, while pH was negligibly (0.1 pH unit) lower for FPMS 8 and 10.

Discussion

Yield differences among clones in this study ranged from a high of 21.3 lbs/vine (6.0 tons/ac) for FPMS 21 to a low of 15.2 lbs/vine (4.4 tons/ac) for FPMS 6, a difference of 39%. The magnitude of the range is similar to that previously reported.[2,3,4,5,9]

Further comparisons cannot be made with Cirami[3] or M.G. McCarthy and A.J.W. Ewart[5] because components of yield were not reported in those studies. Whiting and Hardie found that all measured yield components contributed significantly to yield differences including: clusters per vine, cluster weight, berries per cluster, and berry weight.[9] Bowen and Kliewer reported clonal differences among FPMS 2, 6, and 8 to be due to clusters per shoot and fruitset (average berries per 100 flowers).[2]

However, in this Lodi-Woodbridge study, yield differences were correlated to cluster weight (r = 0.98) but not to

Table II
Growth and yield of Cabernet Sauvignon clones, 1990-1992 [z].

FPMS Number	Pruning wt (lbs/vine)	Yield (lbs/vine)	Tons/ acre	Yield to pruning wt ratio	Cluster number/ vine	Cluster wt (g)	Berries/ cluster	Berry wt (g)	°Brix	Titratable acidity (g•liter^{-1})	pH
2	5.5 bc	19.1 bc	5.4	3.6 b	100 a	87.4 de	91 a	0.96 c	22.4 a	6.2 a	3.66 a
4	5.3 bc	19.6 abc	5.5	4.0 b	95 a	94.0 bc	92 a	1.03 ab	22.0 ab	6.2 a	3.68 a
5	5.7 b	18.5 c	5.2	3.6 b	98 a	84.8 e	90 a	0.95 c	22.3 a	6.4 a	3.68 a
6	6.2 a	15.4 d	4.4	2.6 c	101 a	69. 2 f	74 b	0.94 c	22.6 a	6.2 a	3.67 a
8	4.4 d	20.7 ab	5.9	5.0 a	93 a	100.7 a	94 a	1.08 a	21.4 b	6.2 a	3.55 b
10	4.2 d	19.4 bc	5.5	5.2 a	98 a	91.4 cd	92 a	1.00 bc	21.4 b	6.3 a	3.58 b
21	5.1 c	21.3 a	6.0	4.8 a	98 a	99.2 ab	94 a	1.08 a	22.1 ab	6.3 a	3.65 a

[z] Mean separation by Duncan's Mulitple Range, t= ≤ 0.05$_i$ means followed by the letter are not significantly different.

cluster number (r = 0.71) (figure not shown). Cluster weight differences could be attributed to both berries per cluster and berry weight.

In Cabernet Sauvignon, as in Chardonnay, vine yields are most strongly affected by cluster weights.[12] While in Chardonnay, heavier clusters increase Botrytis bunch rot susceptibility (M. Vail, D. Gubler, and J. Wolpert, unpublished data), there is no such concern in Cabernet Sauvignon, a bunch rot resistant variety.[6]

Pruning weight values were moderate for Cabernet Sauvignon vines in the Lodi-Woodbridge District, ranging from 4.2 to 6.2 lbs/vine (0.6 to 0.9 lbs/ft). Pruning level was set at 36 buds/vine. No allowance was made for the heavier pruning weight of FPMS 6. Application of a balanced pruning concept, and retention of more nodes per weight of cane prunings, could possibly have improved the yield of FPMS 6 and raised its yield-to-prunings ratio to a value considered more desirable.[7]

Berry weight is a component closely watched by winemakers who desire smaller berries for the higher surface-to-volume ratio and concentration of color. Differences found among clones were quite small, on the order of 0.2 g/berry. Berry weights differed much more from year to year, ranging from about 0.8 in 1990 to 1.2 in 1991 (individual year data not shown). This would suggest that environment or choice of cultural practices plays a stronger role in berry size than does clone.

Highly significant year-by-clone interactions were seen for several yield components, including yield per vine, cluster number, cluster weight, and berry weight (data not shown). These may be due to environmental factors such as winter rainfall and seasonal temperatures, especially during fruit-set. Conversely, there may also be some influence of cultural practice, such as irrigation. These factors could have a significant influence on the perfor-

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mance of winegrape clones and should be investigated.

Acknowledgements

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James A. Wolpert is Chairman of UC Dept. of Viticulture & Enology and Viticulture Extension Specialist. Amand N. Kasimatis is Extension Specialist Emeritus in the Dept. of Viticulture & Enology, UC Davis, CA. Paul S. Verdegaal is Farm Advisor for UC Cooperative Extension, San Joaquin County, Stockton, CA.

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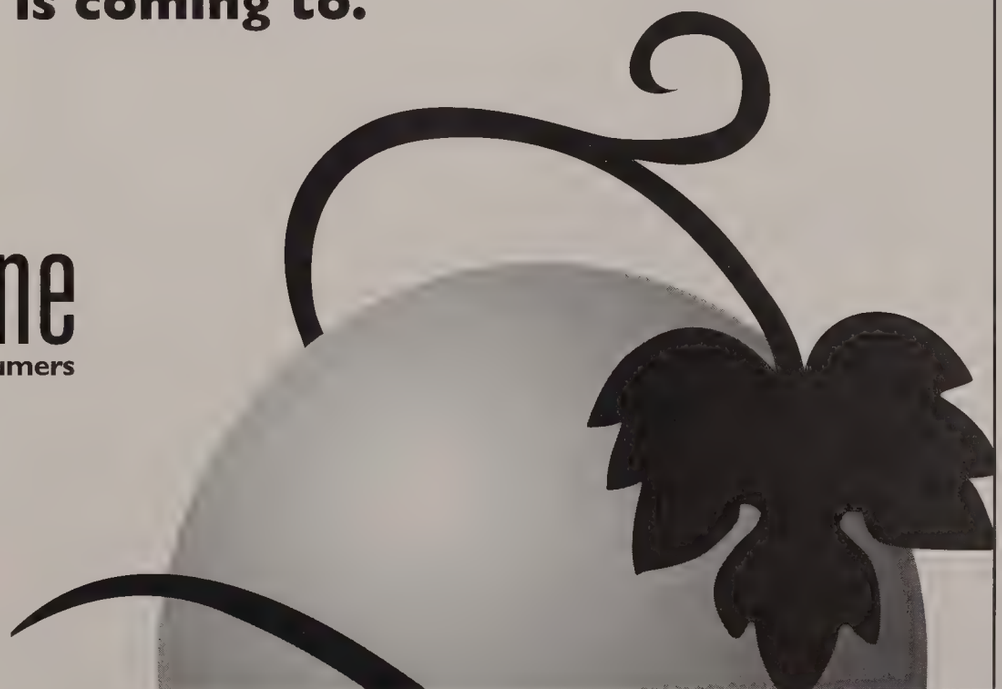

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IMPROVING YOUR TASTING ROOM

Part IV

Direct mail programs

by Craig Root

Staffing your tasting room and operating it in a manner designed to increase profits and memorability have been the focus in the last three articles in this series. In effect, we've created a great theater with skilled actors at work.

Wouldn't it be even better if you could sell your tasting room audience popcorn long after they've left the theater? That's what direct mail programs are all about.

There are three primary ways to relate to the consumer (in reciprocal states) at home:

1. Through a "Friends of the Winery" club members are gathered from signups at your tasting room and at outside events. You send them a newsletter or other mailings inviting them to special events, telling them what's happening at the winery, and offering wine for purchase.

2. By identifying consumers who are large purchasers and contacting them by phone on a regular basis with news about special offers or new releases.

3. Develop a direct mail "club" in which you keep the consumer's signature and credit card information on file and automatically ship them wine on a regular basis.

Wine clubs

The most profitable of these alternatives is the direct mail wine club. Consumers pay you to ship wine directly to their homes. These folks are loyal customers and great ambassadors for your wine. Unfortunately, this approach to direct sales, frequently concerns distributors and retailers. They worry that these clubs are "poaching" business from them. Is this a valid objection?

To my knowledge, there is absolutely no hard evidence to support this argument.

On the other hand, I have personally started, administered, or worked on many clubs and have talked to other club administrators on a regular basis. The clear consensus is that less than 10% of the customers who receive a shipment from a wine club reorder the same wines. When they want more, where else can the other 90% of these consumers buy the wine but from their local retailers?

When the Sunday newspaper includes a sample of coffee or shampoo, someone has spent a considerable sum of money to get the product into your house. Are these manufacturers stupid? Are they wasting their promotional dollars? No — there is a very real expectation that exposing you to their product will prompt you to buy the product and increase their market share in your neighborhood.

With the wine club, we discover a wonderful situation in which consumers happily pay you to deliver your wine into their homes for them to sample. In addition, wineries sell a product — unlike coffee or shampoo — which is intimidating to many consumers. By tasting it in the privacy of their own homes, consumers increase their identification with it and thereby lessen the intimidation factor.

What's more, these club members become more brand-loyal. They talk about and share your wine with friends, relatives, neighbors, and colleagues. As a result of these interactions, won't some of these contacts be influenced to buy your products? It's highly likely they will! Distributors, restaurants, and retailers should rejoice at this exchange because it fuels more sales of your wines. If we take their unfounded argument against the clubs to its conclusion, then you should shut down your visitor center!

Tasting room managers sometimes object that their staff doesn't have time to administer the club. The simple fact is that such a club generates incredible revenue which more than compensates for the cost of a staff person to run it. For example, a club with only 500 members (some have more than 3,000), which ships only six times per year (some ship monthly) at an average cost to the consumer of $30 per shipment, generates $90,000 per year.

Another argument is that "my staff doesn't have time to sell the club." Of course they don't on busy days like the July 4 weekend or Thanksgiving Friday, but there are lots of other times during the year when they do.

"I don't have enough wine to supply the club" is also voiced. If you're selling your wines out every year, wouldn't you like to sell some larger portion of your inventory at retail prices rather than FOB? You can cap the growth of the club at a certain figure to assure a supply of wine for key distributors and on sale/off sale accounts.

"It's illegal to ship wine out of state," others object. No, it's not. It's entirely legal to ship to California and the states which have a reciprocal agreement. However, be sure to consult with your compliance people before starting a club, because even some reciprocal states have special restrictions. The happy news is that even when clubs do ship to all 50 states, California and reciprocal states comprise 60-70% of their consumer base anyway.

Why start a club?

The administrative and production costs for a wine club are low enough to make these clubs the most profitable part of the wine business. On average, you should be making a 50% to 70% true profit on every dollar earned. In addition, the revenue potential is enormous, and there are eight other reasons why the club concept will help your

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overall winery sales:

1. Club members become more brand-loyal.

2. Because they get special perks and benefits, club members are more apt to visit your tasting room and purchase wine whenever they are in your area.

3. By exposing your wine to their friends and talking it up, they become ambassadors for your winery.

4. As previously discussed, this is a paid mass sampling program in which the consumers are paying you to let them try your new varietals and vintages.

5. The incentives that your staff get for selling the club boost their morale and job satisfaction.

6. The special events you do for club members (which they pay for) can also be used to entertain buyers and other trade visitors.

7. You can use the club as an informal focus group by including a card with the shipment that asks members to comment on the particular wine's attributes and deficiencies.

8. Some of the profits from the club can be invested in doing a better job with trade visitors, better display and lighting, or increased training for your staff. These improvements will, in turn, boost sales at the winery and in the general marketplace.

Starting a wine club

If you decide to start a club, where do you begin and what are the pitfalls to avoid?

1. Find a consultant experienced in this concept to make sure that you create a sound business plan. I have frequently been called in, after the fact, to correct problems with clubs which were improperly established.

2. Remember to include perks for the club members: good discounts not available to the average consumer, special attention (time permitting) while they are at the winery, informative newsletters with tantalizing recipes, club events, and occasional low-cost promotional freebies. Remember that people join not only for the wine, but also for the sense of fun and the feeling of being an insider.

3. It is essential to develop an adequate incentive plan for your staff to sell the club. Specific rewards should attach to the number of signups.

4. You will need a club coordinator at part- or full-time, depending on the size of your club.

Except in very rare circumstances, not having a wine club in conjunction with your tasting room means a real loss to your profits and brand-building efforts. Consumers truly enjoy these clubs (some belong to more than one). This subscription service is simply the most efficient marketing tool you could devise: you're not just selling popcorn to the audience after they've left the theater, you are also selling the main feature!

This concludes my series on how to improve the profitability and memorability of your tasting room, but watch for upcoming articles on current and future trends in this area. Please write, fax to: 707/963-6009, or call me at 707/963-7589 with suggestions or comments on this series or what you'd like to see in the future. ■

Craig Root is a 25-year veteran of the wine and hospitality business, including 15 years at Beaulieu Vineyard. He has worked in all capacities at hospitality centers, primarily as manager. For the past three years, he has also served as a consultant for visitor centers through his own company, Craig Root & Associates.

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TOXIC fermentation products– a cause of STUCK fermentations

by Robert K. Mortimer,
Dept. of Molecular & Cell Biology,
University of California, Berkeley, CA
Bénédicte de Carmejane,
Ravenswood Winery, Sonoma, CA
John Quinones

A major problem confronting wineries is stuck fermentations. Such fermentations are defined as those which proceed normally and then stop fermenting with sugar concentrations in the approximate range 2 g/L to 100 g/L.

It is usually difficult to restart a fermentation from the stuck state, and even when successful, the fermentation vessel may be tied up for an extended period of time. If the fermentation cannot be started again, it sometimes may be necessary to blend the stuck wine with wines that have completed fermentation in order to reduce the sugar content to an acceptable concentration.

Materials and methods

Winemakers at nine California wineries (Acacia, Clos Pegase, Far Niente, Franciscan, Louis Martini, Ravenswood, Robert Mondavi, Sebastiani, and Viano) were interviewed. Information was obtained about the different kinds of fermented must (varietal) that stuck, whether temperatures were controlled, what steps were taken to attempt to reverse stuck fermentations, and what success these steps had.

Ten fermentations that had been stuck for time periods of from one to 17 weeks were sampled at three of the above wineries (see Table I, column-3). Samples were collected in 35 mL or 50 mL sterile centrifuge tubes. Collections were made without mixing from the racking valve near the tank bottom of stainless steel tanks or from the top of oak, redwood, or steel tanks using an approximately one-meter long sampling device.

Samples were tested microbiologically in two ways. 1. Cells (both live and dead) in the samples were counted without dilution in a haemocytometer chamber to determine ***visible*** cell titer and, 2. the samples were diluted and plated on YEPD medium, 1% Difco yeast extract, 2% Difco peptone, 2% Difco dextrose, 2% Difco agar to determine ***viable*** cell titer, based on colony counts and dilution factors.

In addition, several chemical analyses were carried out. Sugar content of the wines was determined in two ways.

Table I – Microbiological and Chemical Examination of Stuck Fermentations

Fermentation	Must	Time in stuck state, days*	Residual sugar g/liter	Ethanol conc. %	Volatile acidity g/100ml	Visible titer x 10^6 cells/ml	Viable titer x 10^5 cells/ml	% viable cells
RWD A[1]	ZN	8	47	13.3	0.04	54	41	7.6
RWD B[1]	ZN	8	43.5	12.2	0.04	63	73	11.6
RWD B[1]	ZN	90	19.2	14.8	0.08	1.5	0.168	1.15
RWD C[1]	ZN	90	33	13.8	0.08	2.8	0.184	0.65
RWD D[1]	ZN	98	47	14.1	0.04	59.8	.036	0.06
RWD E[1]	ZN	120	16.5	13.8	0.04	6.1	0.0001	0.00002
RWD F[1]	ZN	101	22	14.4	0.06	0.94	0.0001	0.001
RWD G[1]	ZN	90	13.4	15.3	0.05	1.25	0.036	2.8
FN DL-IN[2]	SB	32	114	13.75	0.10	2.9	2	0.6
CP CH8	CH	60	19	13.1	0.066	3.3	<1	$<10^{-3}$

[1] The letters A,B,C,D,E,F,G refer to different vineyards.
[2] The fermentation FN DL-IN started at a Brix value of 33.2.
* Time from when sugar concentrations ceased to decrease until the sample was taken. Column could be "Days post-crush until sample was taken." This would require adding 3 to 6 days to values in column #3.

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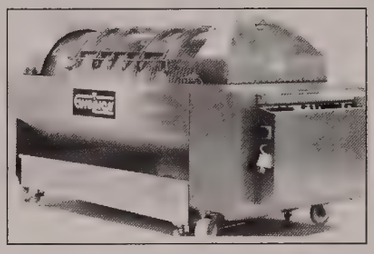

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For early stages of fermentation, hydrometer readings were taken and these were recorded as °Brix values. These values are shown in Table I. This method gives fairly accurate values for sugar content except for low sugar concentrations, which are underestimated. The other method involves enzymatic determination of sugar content and this method was used for all of the values presented in Table I. The Boehringer Mannheim kit (Cat. No. 139 106) for D-glucose/D-fructose was used, as specified, for these determinations.

Ethanol content was measured by determining the boiling point of the wine (ebulliometry) and corrected for sugar content, or by gas chromatography (GC). Volatile acidity was measured by using the Boehringer Mannheim kit (Cat. No. 148 261) for acetic acid determinations, as specified, or by distillation and titration with 0.02 N NaOH. The results of these different tests are shown in Table I.

Author's Note: The GC method gives a more precise value for ethanol content, but must be done by a specialized laboratory such as E T S. Ebulliometry is accurate to 0.1% ethanol whereas GC gives accuracy to 0.01% ethanol. Volatile acidity — Ravenswood and Clos Pegase used the enzymatic method, whereas Far Niente used the distillation-titration method. Both methods give comparable accuracies.

Results and discussion

Microscopic examinations of the colonies on the plates revealed that all of the cells appeared to be of the genus *Saccharomyces*. The microscopic appearance of most of the cells corresponded to that of dead cells, and the plating results confirmed this. Viabilities ranged from 2×10^{-5}% to 11.5% (Table I). This is in sharp contrast to fermentations that go to completion in which nearly all of the cells of this yeast are viable even for several weeks after fermentation is complete (Mortimer, unpubl.). The visible cell titers ranged from 9.4×10^5 cells/ml to 6.3×10^7 cells/mL. We believe that titers lower than those seen normally for samples taken at the end of fermentation (3 to 7×10^7 cells/ml) are due to settling of the *Saccharomyces cerevisiae* cells.

Residual sugars were in the range of 13.4 to 114 g/liter while ethanol concentrations ranged from 12.2% to 15.3%. Volatile acidity measurements were all within the range (0.4 to 1.0 g/L).

The interviews revealed that probably all fermentations (various musts) have the possibility of sticking and that fermentations may stick even under conditions of controlled temperatures. Several wineries reported that addition of yeast nutrients (ammonia nitrogen adjusted to at least 150 mg/L of nitrogen), even at the start of fermentation, did not prevent stuck fermentations. Also, addition of nutrients to stuck fermentations did not reverse these fermentations.

It appears that the factor(s) which determine whether a fermentation will or will not stick are at least partially vineyard-determined. For example, when grapes from a given vineyard are crushed and the resultant must is then placed in more than one fermentation tank, if one tank sticks, all tanks from the same vineyard also stick.

These findings and our experimental results will be considered in light of the various models that have been proposed to explain stuck fermentations.

Possible explanations for stuck fermentations include: 1) depletion of essential nutrients and micronutrients; 2) excessive temperatures during fermentation; 3) introduction of a toxic agent (such as excessive bisulfite) at the time of crushing; 4) killer yeast; 5) production of a toxin by a competing microorganism and, 6) development of a toxic agent or inhibitor during the fermentation.[2] Results that pertain to these various models will be presented.

Nutrient depletion

A frequently cited reason for stuck fermentations is depletion of essential nutrients.[5] Such essential nutrients could include a nitrogen source, vitamins, salts, and trace elements.

It has been stated that a "lack of primary assimilable nitrogen is a common cause of stuck fermentations and off-odors (reduced sulfur, esters). Nitrogen must be added at the beginning of fermentation when the yeast cells are able to take it up and utilize it. Dead yeast cells cannot utilize it. Assimilable nitrogen must be added in amounts that are sufficient to overcome the deficiency. In New York experience, additions of less than 0.5 g/L in most cases were not sufficient." (Henick-Kling,

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personal communication.)

The fermentations in this study were all supplemented with diammonium phosphate to a concentration of 0.15 g/L at the start of fermentation.

The strongest argument against the nutrient depletion model is that stuck fermentations can be reversed by dilution with water or with a dry wine (de Carmejane, personal communication, Quinones, personal communication).

High temperatures

The fermentation process is exothermic and temperatures can climb considerably during active fermentation. Temperatures in excess of approximately 43°C (109°F), particularly in the presence of ethanol, will kill cells of *Saccharomyces cerevisiae* and this would then stop the fermentation.[15] However, stuck fermentations occurred under conditions in which temperature was controlled well below this maximum.

Toxic agents introduced at time of crushing

Toxic agents could also be introduced on the grapes from vineyard treatments with fungicides or pesticides. One would expect such agents to affect the fermentation from the beginning; instead it is found that the kinetics of stuck fermentations, at least the ones examined in this study, proceed normally until the point of sticking. The length of lag and the rapidity of fermentation are all within the normal range until the fermentation ceases.

Killer yeast

It is known that some strains of *Saccharomyces cerevisiae* are able to produce and excrete a glycoprotein toxin that will kill other strains of this yeast that are sensitive to the killer factor. Killer strains will not kill other killer strains.

It is proposed that a yeast population made up of killer and sensitive cells will lose the sensitive cells through inactivation by the killer factor. However, in one experiment, in which marked killer and sensitive cells were used, even at a ratio of two killer cells to one sensitive cell, not all the sensitive cells were killed.[10] This explanation cannot easily explain stuck fermentations because even if all the sensitive cells were killed, the surviving killer cells would be expected to grow and replace them and complete the fermentation.

Toxin from a competing microorganism

Another hypothesis proposes that a competing microorganism develops that produces a toxin or inhibitor that stops the fermentation. However, no other microorganisms besides *Saccharomyces cerevisiae* have been found in the stuck fermentations in this study, which argues against this model. This statement must be qualified by the fact that we plated the fermentation musts on yeast extract-peptone-dextrose (YEPD) agar plates, which likely would not support the growth of many species of bacteria, but would allow the growth of most species of yeast (including *Kloeckera apiculata*) and mold. Our many years of experience with YEPD medium leads to this conclusion. We rarely see bacterial contaminants on our plates, but often see contaminants of molds or other yeasts. Also, we know directly that at least *E. coli* grows very poorly on YEPD medium.

In some stuck fermentations, high concentrations of acetic acid have been detected and these are associated with high populations of *Lactobacillus*, Acetobacter, and of *Kloeckera apiculata*.[3,4] Removal of the acetic acid by reverse osmosis and ion exchange permitted such stuck fermentations to ferment to completion.[11] The concentrations of acetic acid (the major component of volatile acidity, VA) in the fermentations described in the present study were all within the range 0.4 to 1.0 g/L).

Accumulation of a toxic fermentation product

Wine fermentations result in the production of a large number of biochemical products. Many of these products derive directly from the grape, some are derived from the grapes but are modified by the yeast during fermentation, and others are direct products of yeast metabolism and autolysis.

It is known that the concentrations of many products depend both on the specific must and on the yeast strains carrying out the fermentation.[14] It is proposed that one or more of these fermentation products are toxic to cells of *Saccharomyces cerevisiae* and, if they accumulate to a sufficiently high concentration, will kill these cells and stop the fermentation. This effect would depend both on the chemistry of the grapes and on the yeast cells carried by these grapes or used in inoculation of the must.

During the analyses of the stuck fermentation CPCH8, we found that dilution of a sample of the stuck wine with water (50/50) followed by inoculation with active wine yeast resulted in a reinitiation of fermentation. The same effect was also found after dilution with a dry wine. This would not be expected if nutrient depletion was the cause of the stuck fermentation. This finding is consistent, however, with the presence of toxic materials in the stuck wine.

It has been proposed that accumulation of the metabolic products, octanoic and decanoic acid, could stop fermentations because of the toxicity of these products.[6,7,1] This theory seems to offer a possible explanation for most of the observations on stuck fermentations.

A model to explain stuck fermentations

Results of the microbiological analysis of the stuck fermentations (Table I) clearly demonstrate that these fermentations are associated with the death of a majority of the *Saccharomyces cerevisiae* cells. The titer of cells seen microscopically is in the range of 9.4×10^5 cells/ml to 6.3×10^7 cells/ml. The latter titer is seen for fermentations that go to completion and lower values probably represent settling of the cells. Most of the cells in these stuck fermentations are dead.

Further, addition of actively fermenting cells to stuck fermentations resulted in inactivation of the added cells and not in a reinitiation of fermentation. This and the results presented in Table I indicate that stuck fermentations contain material that is toxic to *Saccharomyces cerevisiae* cells.

It is proposed that one or more normal products of fermentation, possibly hexanoic, octanoic, decanoic or dodecanoic acid, which are usually synthesized at subtoxic concentrations, on occasion will be produced at higher and toxic amounts. Whether or not this occurs would depend on the particular must and/or on the yeast cells fer-

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menting this must which could explain the apparent random nature of this phenomenon.

It has been shown that octanoic and decanoic acids are toxic to *Saccharomyces cerevisiae* and that this toxicity is increased in a synergistic fashion in the presence of ethanol.[6,14,15,16] Lafon-Lafourcade *et al.* (1984) state "the inhibition and stoppage of alcoholic fermentation — is not caused by nutritional deficiencies. Rather, it is due to the syntheses by the yeasts of substances other than ethanol that become toxic. Some ethyl esters and fatty acids, in particular decanoic and octanoic acids, have been identified among these substances, and these may be expected to act in synergy with ethanol." This synergistic action can explain the suddenness with which fermentations become stuck.[15]

The concentration of ethanol and of the toxic fatty acids increase steadily during a fermentation and, if they reach combined toxic concentrations, the wine yeast cells will be killed and the fermentation will stop.[1] The normal concentration (non-toxic concentration) of these two fatty acids in dry wine are in the range of 0.2 mg/L to 5 mg/L and increases in these concentrations by two to three-fold in the presence of ethanol are toxic. Addition of yeast hulls could relieve stuck fermentations. This was correlated with a reduction in the concentrations of toxic fatty acids.[6] Finally, the concentration of the toxic fatty acids in wine was strongly dependent on both the yeast strains carrying out the fermentation and on the composition of the must.[13]

In a study of the fermentation of a filtered white wine must inoculated with *Saccharomyces cerevisiae* Montrachet, the clarified must fermented to 3° to 4° Brix and then stopped fermenting.[1] Addition of grape solids (sterilized) removed during the filtration, yeast hulls or both added to different samples of the same must permitted complete fermentations. The concentrations of hexanoic, octanoic, and decanoic acid were measured during these fermentations and all were found to be at concentrations two to three times higher in the stuck wine than in the wines that had fermented to completion. This study provides direct evidence that elevated concentrations of these fatty acids can cause a stuck fermentation.

The concentrations of the fatty acids depend on the must, on the yeast strain(s) involved, and probably also on winemaking practices.[13] Forty different strains of *Saccharomyces* were used to ferment a single must and the concentrations of octanoic, decanoic, and dodecanoic acid were measured. For octanoic acid, these concentrations varied from 0.29 mg/L to 7.1 mg/L. Similar wide ranges were seen for the other two fatty acids.

In addition, 44 different native yeast fermentations at nine wineries were studied. The concentrations of octanoic acid, for example, varied from 1.74 mg/L to 10.53 mg/L and the other fatty acids were also distrib-

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Some wineries had consistently high concentrations of these fatty acids for different wines. In addition, it appeared that Pinot musts at different wineries also had high contents of fatty acids. It was stated that the wines with high fatty acid concentrations "had shown an unusual prolonged end of fermentation" and that "this supports the hypothesis that one of the causes of stuck fermentation is connected to high amounts of medium chain fatty acids."

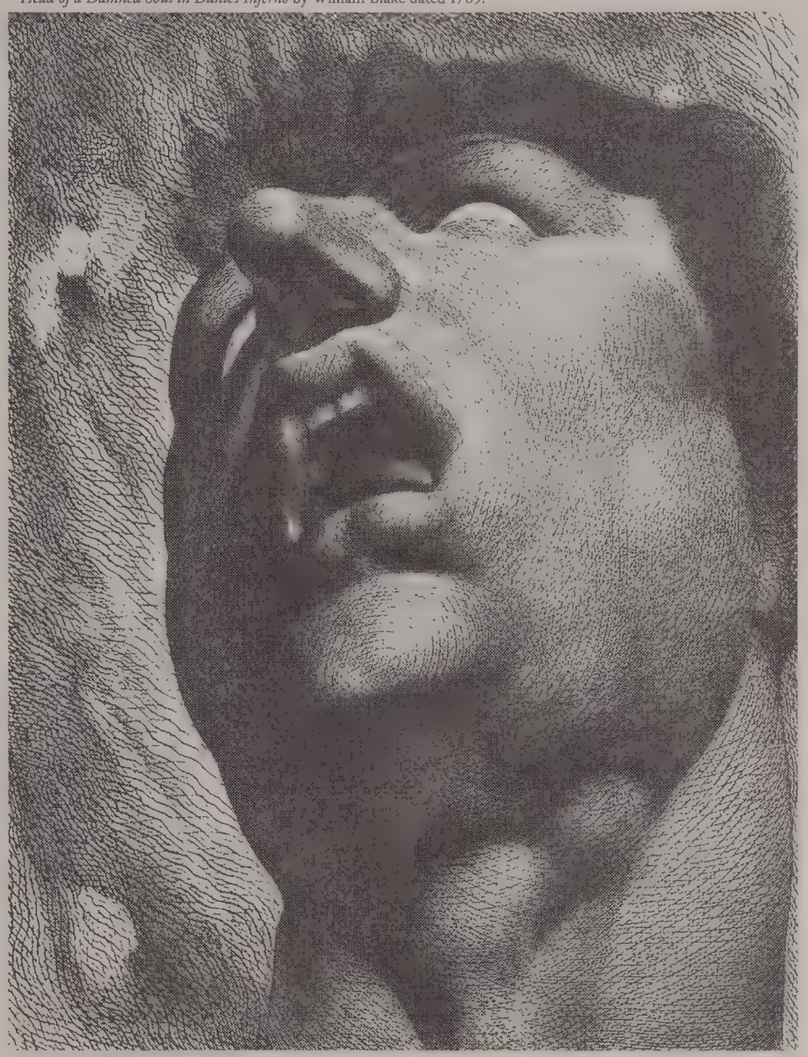
We plan to measure the concentrations of the toxic fatty acids in wines that have fermented to completion and in wines that have stopped fermentation. These studies will be carried out during the 1996 harvest. We attempted to measure these values in the wines discussed in Table I but were unable to do so until several months after the end of the 1995 season and the results were inconclusive.

Because of this, we lack evidence that our stuck wines had higher levels of the fatty acids. This report shows that stuck wines have dead cells and that there is a toxic agent in these wines. We must, for the present, rely on the research of others to support the model that the toxic agents are octanoic and decanoic acids.

Summary

1. Stuck fermentations represent a major problem for wineries.
2. We have found that the *Saccharomyces cerevisiae* cells in most stuck fermentations have greatly reduced viabilities.
3. It appears that the cause of stuck fermentations in such cases is due to the buildup of toxic fermentation products.
4. Based on work in several other laboratories, the most likely candidates for these toxic products are medium-chain length fatty acids acting in synergy with ethanol.
5. The concentrations of these fatty acids, octanoic, decanoic, and dodecanoic, depend on the yeast strains carrying out the fermentation, on composition of the must, and on winemaking practices.[12]
6. Based on the findings of Ravaglia and Delfini, prevention of stuck fermentations might possibly be achieved by selection of appropriate yeast strains for inoculation or by modifying winemaking practices.
7. Reversal of stuck fermentations might involve reducing the levels of ethanol or of the fatty acids: a) Ethanol concentrations can be reduced physically by reverse osmosis or by use of the spinning cone centrifuge; b) Fatty acid levels can be reduced by addition of material that adsorbs or interacts with the fatty acids such as yeast hulls, activated charcoal, or gelatin; c) Both ethanol and the fatty acid concentrations might be reduced by diluting the stuck wine with dry wine that has lower concentrations of both components. Gelatin was shown to reverse a stuck fermentation by de Carmejane at Ravenswood Winery (de Carmejane, personal communication).

Head of a Damned Soul in Dante's Inferno by William Blake dated 1789.



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8. Some stuck fermentations, after many months, will begin fermentation again. This happened to most of the fermentations described in Table I. Our interpretation of this phenomenon is that the dead yeast cells in a stuck wine behave as yeast hulls and gradually remove most of the toxic fatty acids from the fermentation. Oxygen concentrations may also be important in this process. Oxygen is needed to promote new yeast cell growth which is needed because of the low viabilities. ■

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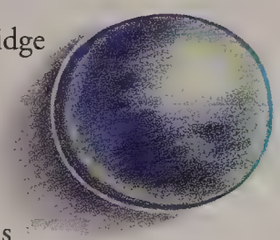

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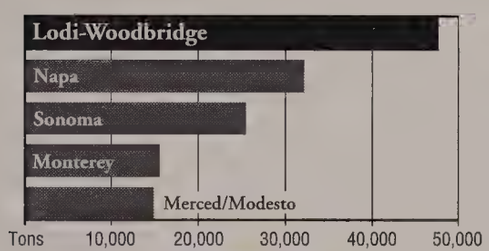

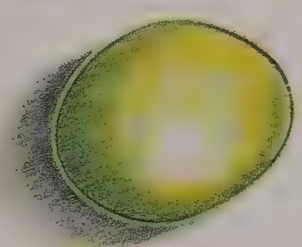

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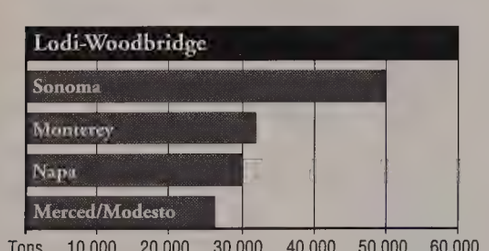

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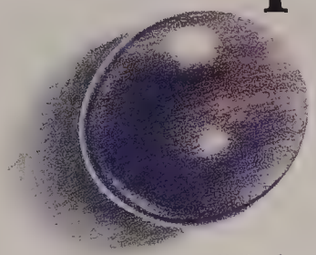

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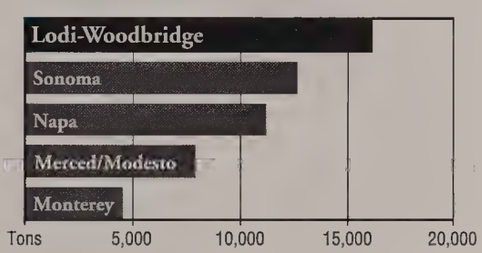

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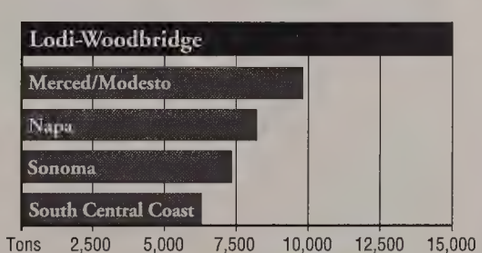

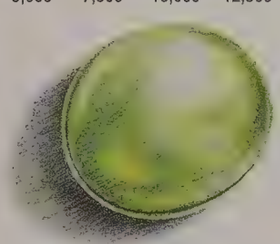

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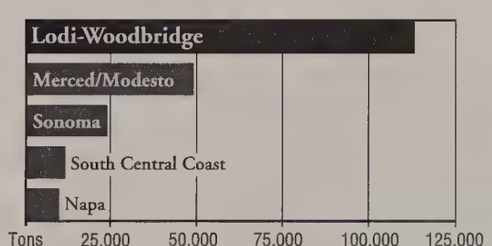

*Source: CA Department of Food and Agriculture

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Oregon producers struggle with weather pressures, growing season variability, site specificity, and on-the-ripening-edge vineyard elevations.

MAKING Quality DECISIONS for Oregon PINOT NOIR

by Eleanor & Ray Heald

Pinot Noir has put Oregon on the red wine map over the past 20 years. The majority of Oregon Pinot noir vineyards are located on hills overlooking the Willamette River valley in a north-south corridor from Portland to Eugene, 50 to 60 miles inland from the Pacific Ocean.

The region is ideal for cool-climate grape varieties such as Pinot noir. Thirty years ago, skeptics thought the region was too cool. Today, however, Oregon Pinot Noir is state of the art, as producers have learned to make crucial decisions in the vineyard and winery.

Oregon producers struggle with weather pressures, growing season variability, site specificity, and on-the-ripening-edge vineyard elevations. They have learned to pick by flavor profile and vine condition at harvest, while keeping a watchful eye on the western sky. Vineyard management has led to lower yields (2.5 - 3.2 tons) on more balanced vines. The quality of fruit from vineyards 20 years and older is now being assessed against newer plantings with closer spacing.

PWV invited a number of winemakers to discuss the crucial elements making quality Pinot Noir in Oregon. This is their report:

Growing season variables

"We're farmers, every weather condition affects us," says Trudy Kramer. "We have tremendous variations in our growing season because of weather pressures."

John Haw adds that nearly every growing season in Oregon gets a rocky start. "However, the extended season in September and October is usually perfect for ripening Pinot noir and gives the final kick the grapes need."

Don Kautzner (Adelsheim Vineyard) says this has been the case since 1987. The years 1991 and 1993 exemplify what Oregon can achieve even in a late year with "hang-time" and a cool, dry autumn.

On the other hand, Kautzner points to 1992 which was an earlier, hotter growing season. Grapes got ripe, but without the advantage of long hang-

FEATURED PRODUCERS:

ADELSHEIM VINEYARDS
Newberg, OR
Don Kautzner

BEAUX FRÈRES
Newberg, OR
Michael Etzel

CRISTOM VINEYARDS
Salem, OR
Steve Doerner

ERATH WINERY
Dundee, OR
Dick Erath and Rob Stuart

KRAMER VINEYARDS
Gaston, OR
Trudy Kramer

MONTINORE VINEYARDS
Forest Grove, OR
Jacques Tardy

ST. INNOCENT, LTD.
Salem, OR
Mark Vlossak

SOKOL BLOSSER WINERY
Dundee, OR
John Haw

time. "That's not the optimum we're looking for with Oregon Pinot Noir," he contends. "We need to have a good October to make the best wine."

Dates for vineyard events such as bud break, bloom, and harvest can vary widely. "In most years, bloom is in mid-June, but we've gone as late as July," Haw explains. "In 1992, we picked in the second and third week of August, almost two months earlier than we prefer."

Steve Doerner points to other variables affecting harvest dates, such as elevation, cropping levels, and preferred picking parameters. "Pinpointing harvest in Oregon is next to impossible," he reports.

Mark Vlossak cites about 104 to 107 days between bloom and harvest, but at the same vineyard, this window can extend from 112 to nearly 114 days for other winemakers depending on their preferences for mature grape flavors.

Vineyard considerations

In Doerner's opinion, a great vineyard site in Oregon is one that ripens the fruit. In most locations, a western exposure would not be good, because grapes would get too much afternoon sun. South and southeast are best, or in some locations southwest.

Many Oregon Pinot noir vineyards are own-rooted. This was the initial practice at Beaux Frères, for example, until phylloxera was discovered. Succeeding plantings have been on 3309, 5-C, 101-14, Riparia Gloire and other rootstocks.

Viticulture is a primary concern at Beaux Frères says Mike Etzel. Vines are pruned to eight buds per vine in a vineyard that's spaced 40 inches between vines with six-foot aisles. Every year, a single shoot comes from one location; the spur has two canes rather than four, and all canes are removed from two-year wood. Manual shoot-thinning is done three times in a growing season, and leaves are pulled just before veraison. Fruit is allowed to size up, then crop is dropped for an approximate yield of two pounds per vine.

Haw adds that leaf stripping just before veraison is the preferred practice, but it is sometimes done earlier to open the canopy for spray penetration, especially if there is rain around the time of bloom.

While Etzel talks about yields in pounds per vine, other winemakers discuss yields of about three tons per acre (TPA). Vlossak says you can't isolate lb/vine without also discussing spacing. "Realistically, yields are all over the board," Jacques Tardy admits. "I think it's most honest if we say that we prune for three TPA. If the crop is heavier, it's easy to drop some fruit at veraison, but in the past six harvests at Montinore, we only had to do that once. Mother Nature usually does it for us during bloom."

Kautzner says it's far too early to discuss yields with the closer spacing that many growers are introducing in Oregon now because vines are too young. "The theory is fine, but we haven't witnessed it in practice," he says. "It will be years before we can make comparisons between close spacing and 22-year-old vines which are currently making great wines. We simply don't know that closer is better. A balanced vine may be the greater issue in wine quality."

Picking decisions

These winemakers make picking decisions based on desired fruit flavors, which differ from winemaker to winemaker, fruit and vine condition, and weather or weather forecast. All participants agree that it is ridiculous to pick by a numbers game, especially Pinot noir.

When pushed to state optimum Brix, pH, and TA, the winemakers asked whether these numbers were from the gondola, after pre-fermentation cold soak, or in Kautzner's winery, during fermentation. "I never collect numbers until the second day in the fermentor," he asserts.

Vlossak speaks for the group when he says: "It's all in the flavor and condition of the fruit. In 1994, I didn't even bother with number gathering. As a winemaker, I can fix the sugar, acid, and pH, but I can't fix the flavor. It's either there or it's not. It's entirely subjective and differs from one vineyard to another."

At the crush pad

When asked whether grapes were crushed, left whole berry, or whole cluster, Rob Stuart speaks for many in the group by saying, "I'd rather say destemmed, whole berry to the fermentor. At

Erath, that's about 30% whole berry."

Participants say that much of what is done at the crush pad depends on the year, degree of fruit ripeness, and fruit temperature. Kautzner tries to retain as many whole berries as possible after destemming. Use of whole clusters is an entirely different issue. Only in certain vineyards can one find grape stems that make a positive addition to a wine. Therefore Kautzner limits usage of whole clusters to two or three vineards (out of 10) and then at percentages lower than 30%.

Doerner counters that this decision is more site-specific and that he ferments whole clusters from two vineyard sources every year, occasionally from other vineyards, and there are some vineyards where he would not consider it.

"For me, whole clusters must add structure without contributing bitter tannins or accentuating them," Doerner maintains. "They firm up the wine's middle, elevate the fruit, and offer a balancing component to the wine."

His criterion is based on experience from specific vineyards. With some vineyards, any stems produce vegetal components while stems from other vineyards add spicyness or complexity. "When you begin to understand a vineyard, you know what to expect," says Doerner.

Haw notes that in years when bunches have small berries, it's not advisable to employ whole-cluster fermentation. Large berries allow a greater juice to skin ratio and then whole clusters add character to the juice. "However, you don't want this character in every lot," he says.

Vlossak's ferments whole berries rather than whole clusters and says the issue boils down to stylistic flavor decisions.

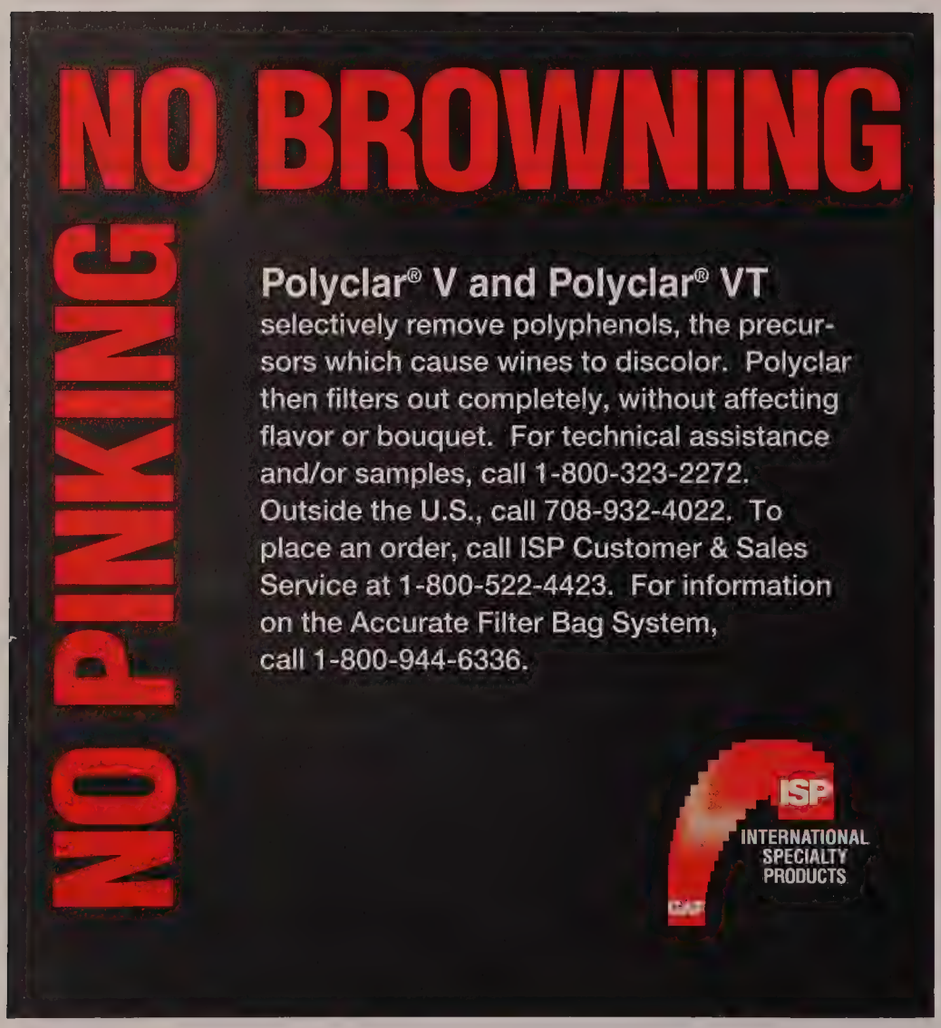
Not new wave

"It's becoming vogue to talk about pre-fermentation cold soaks," Kautzner suggests. "It's like Burgundy's new thing — but it's not. In Burgundy, most don't inoculate and never have. I don't inoculate. In most harvests, it's as cold in Oregon as it is in Burgundy, and as a result, it takes two to four, or maybe five days, for fermentation to start."

On healthy fruit, Kautzner adds 50ppm SO_2 prior to soaking. If there's any kind of fruit damage, he increases the addition, but says he has never used more than 90ppm on damaged fruit.

Some producers inoculate, and some use a mix of inoculated and uninoculated tanks.

***PWV** thanks Sokol Blosser for hosting the discussion and tasting.*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Adelsheim Vineyards

Newberg, OR
Don Kautzner, winemaker

Style

Don Kautzner explains that letting the vineyard express itself more than the winemaker is his stylistic goal. He makes a wine that has significant strawberry and blackberry aromas with mirrored flavors and soft, round mouthfeel.

Over the past five years, closer spacing in the planting of new vineyards with a Pommard clonal selection and slower, longer fermentations have contributed to improved wine quality at Adelsheim Vineyards.

To achieve more forward fruit in the wine, 20% whole berries are used with as little berry maceration as possible. To call attention to style, Adelsheim bottles some vineyard-designated wines.

Winemaking

Uninoculated primary fermentation occurs in open-top tanks where maximum juice temperature reaches 90°F and completes in 10 days. The cap is punched down twice daily until it is moist. Pressing decisions are based on taste and whether or not to retain press fractions is also a taste decision. Malolactic fermentation (MLF) is uninoculated and usually occurs in the barrel. "We want to get the wine into barrel as soon as possible and believe that the wine is somewhat rounder when MLF occurs in barrel," says Kautzner.

Wine goes to a mix of new to five-year old Allier and Tronçais barrels on light lees 24 hours after pressing. Two aerative rackings are done during the 10-month regime. The free SO_2 level is

maintained at 10 to 20ppm.

One to two months before bottling in June, wine is egg-white fined, but not filtered. It is released 10 months after bottling.

Beaux Frères

Newberg, OR
Michael Etzel, winemaker

Style

Michael Etzel aims for a big, ripe, intense style. The wine is bottled without racking and is unfiltered. The wine has deep coloration with very ripe cherry, currant, and smoky new oak components.

The winery's seven-year-old vineyard is planted 60% to a Pommard clonal selection and 40% to Wädenswil.

Etzel suggests that leaf pulling in the fruit zone, crop thinning at veraison, and picking very ripe fruit have made significant contributions to wine quality.

Winemaking

Juice with 80% whole berries is given a five-day cold soak with 50ppm SO_2 added before inoculation with Burgundy and RC 212 yeast cultures. Fermentation completes in eight days in open-top tanks. Peak juice temperature is 92°F. Punchdowns and pumpovers are done twice daily for 10 minutes. Total skin contact before pressing is about 19 days. MLF is inoculated with OSU ML strain.

Wine is pressed two days post-dryness and all press fractions are used.

The 10 to 14-month barrel regime on heavy lees is in a mix of new and once-filled Allier, Nevers, Vosges, and Burgundy barrels. Wine is never racked, but free SO_2 level is maintained at 25ppm. It is bottled unfined and unfiltered and aged one month before release.

Cristom Vineyards

Salem, OR
Steve Doerner, winemaker

Style

Balance is a key objective for Steve Doerner. Whether the wine is on the elegant side or more powerful is less important than that all elements fit together harmoniously. Allowing the vineyard to express itself is an ultimate part of the style.

Doerner says that an abundance of focused red fruits often dominates the nose of wines from the Willamette Valley. This fruit opulence plays a major role in palate perceptions and is accompanied by earthy undertones.

Pinot Noir clones — 113, 114, and 115 — are planted in a three-year-old vineyard in the Eola Hills.

The most significant factors contributing to quality are greater fruit exposure to light in the vineyard and lower yields.

Winemaking

After a 25ppm SO_2 addition, ½ whole clusters and ½ destemmed berries cold-soak for three to four days, before the onset of an uninoculated fermentation in open-top tanks. Peak juice temperature is 86°F during a 10-day fermentation. Punchdown is done three times daily for 10 minutes.

Wine is pressed when the cap falls, and all press wine is used. Racking with heavy lees to one-third new Center-of-France cooperage is immediate. The OSU malolactic inoculum is added to barrels so that the alcoholic fermentation has completed before malolactic fermentation, so there will be no competition between yeast and malolactic bacteria for nutrients. During the 12- to 16-month barrel regime, wine is racked once and free SO_2 level is maintained at 35ppm.

An egg-white fining is done three weeks to a month before bottling, and the wine is racked off in three to four weeks. An unfiltered bottling is done one year after harvest, and wine is released four months later.

Erath Winery

Dundee, OR
Dick Erath and Rob Stuart, winemakers

Style

Developing fruit concentration by minimal manipulation enhances both aroma and flavor. This is the goal for

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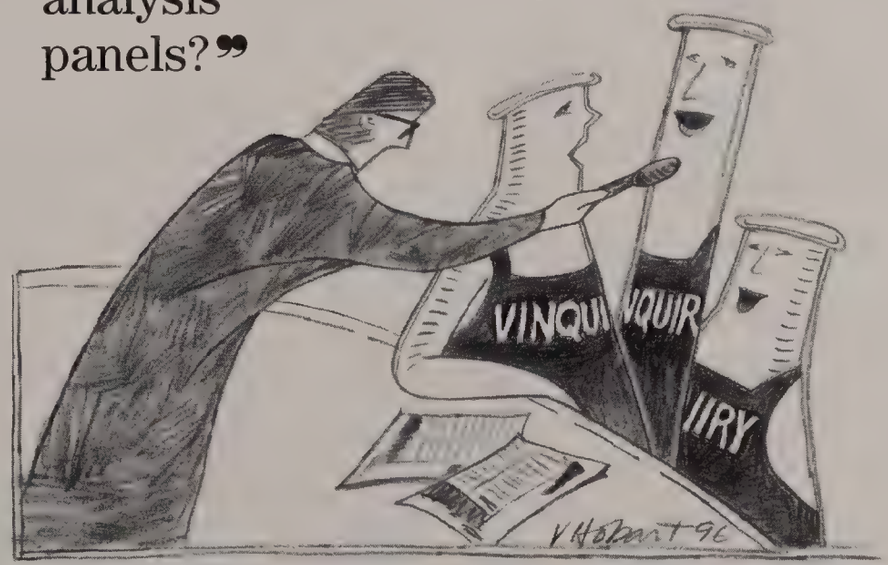

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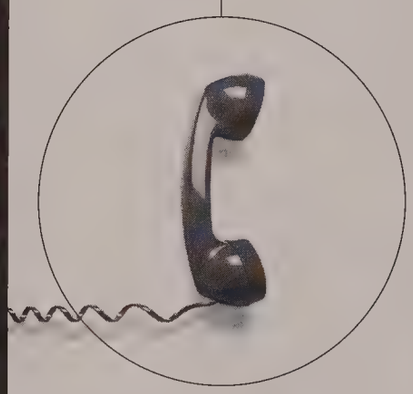

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Dick Erath and Rob Stuart. A sophisticated wine should offer a long continuum of flavors and a pleasing finish.

Erath Winery produces a "pyramid" of Pinot Noir. Vintage Pinot Noir (10,000 to 18,000 cases/year) is characterized by its forward fruit flavor and good balance. In better than average years, Vintage Select (2,000 to 3,000 cases/year), Reserve (500 to 2,000 cases/year), and vineyard-designated (up to 500 cases/year) wines are made from selected sites where vines are between 10 and 20-years-old. When produced, these wines are released 2.5 years after harvest.

Cherry, strawberry, raspberry, and plum aromas are enhanced by dark chocolate, cocoa dust, and a slight mushroom character. Flavors are concentrated, almost liqueur-like cherry and raspberry with occasional plum components.

The winery's oldest vineyards in the Dundee Hills are 27 years old, planted to Pommard and Wädenswil clonal selections. There is a new three-year-old planting of Colmar and Dijon clones (spaced 4x8).

Erath and Stuart say cold pre-soak maceration, gas racking, and long ageing of reserve wine components for potentially unfiltered products have made the greatest contributions to wine quality.

Winemaking

Depending on the year and vineyards sourced, about 30% whole berries (with crusher rollers wide open) are fermented after a 48-hour cold soak. Some tanks are inoculated with Prise de Mousse ADY and others are uninoculated. During an eight to 10-day fermentation, reaching a peak must temperature of 85° to 90°F, the cap is irrigated once or twice daily for 20 minutes. MLF occurs uninoculated.

Wine is pressed two days post-dryness, and press fractions are not used. About a week after pressing, the first SO_2 addition is made. Ten to 15 ppm free SO_2 is maintained until bottling. Wine is barreled with light lees for 14 to 16 months in approximately 10-15% new and 85-90% two-year-old and neutral French cooperage. Wine is racked with nitrogen gas in late spring and again in late summer.

Prior to bottling, wine is often egg-white fined and racked off in two weeks to one month. The preference is to bottle wine unfiltered with a clean racking 14 to 18 months after harvest. If filtration is required, the following process is followed until zero population of bacteria is attained: DE, SWK 200s, EK, and then sterile membrane.

Wine is bottle-aged 18 months before release.

Kramer Vineyards

Gaston, OR
Trudy Kramer, winemaker

Style

Trudy Kramer strives for full fruit expression in a wine that is very drinkable in its youth and serves as a crossover for consumers professing they don't like red wines. The wine gets 11 months ageing in French oak barrels from a mix of forests and mixed ages.

Raspberry and cherry aromas and flavors are dominant, but there is a broad range of expression within these fruits due to a variety of soils and elevations on the estate.

Newer clonal selections of Pommard, and 115 along with thinning for older plantings are contributing to improved wine quality.

Winemaking

Immediately after crushing, juice is inoculated with Wädenswil 27 ADY. Fermentation in one ton closed-top bins completes in seven days with juice temperature peaking at 90°F. Hand punchdown is done twice daily until pressing.

Once fermentation completes, wine is pressed and goes to a mix of one- to five-year-old French barrels until the following September. The OSU ML strain is added two weeks after pressing to reduce problems from residual sugar interacting with MLF. Press fractions are barrel-aged separately until blending decisions are made at the May racking. Once MLF completes, the first SO_2 addition of 50ppm is made and maintained at 25ppm free thereafter.

Barrels are racked in May, egg-white fined in August, and racked to tank in two weeks to blend in tank before bottling in September. The wine is given a medium-pad filtration. Bottle ageing of seven months is usual before release.

Montinore Vineyards

Forest Grove, OR
Jacques Tardy, winemaker

Style

Making a full-flavor, medium-bodied wine with silky tannins within an oaky frame and a good balance between fruit and oak is Jacques Tardy's objective.

When grapes are not fully mature, they display a strawberry fruit with a minty, spicy aftertaste. When fully ripe, they tend toward red and black cherries with black currant and cassis.

Montinore vines planted 13 years ago are Pommard selection massale sourced from Ponzi Vineyards budwood.

Winemaking

About 50ppm SO_2 is added at the crusher. From seven to 14% whole clusters in juice are cold-soaked for six or seven days before inoculation with Assmannshausen and RC 212 ADY. During a five- to seven-day fermentation in open-top tanks, where peak juice temperature is 85°F, the cap is punched down twice daily for 10 to 15 minutes. ER1A and EY2D ML strains are used.

Wine is pressed four to seven days post-dryness. Press wine is not used in the blend. The 10- to 11-month barrel regime begins seven to 10 days after pressing in a mix of new to seven-year-old Allier, Nevers, and Vosges cooperage. One racking is done, and free SO_2 level is kept at 25ppm once MLF completes. MLF occurs in barrel.

Wine is not fined but DE filtered, then filtered with standard super cel after cold stabilization. EK pads are used at bottling before the next harvest. Before release, wine is given six months bottle ageing.

St. Innocent, Ltd.

Salem, OR
Mark Vlossak, winemaker

Style

Mark Vlossak's goals are to extract vineyard-specific varietal fruit flavors and produce a complex, balanced wine with moderate ageing potential that works in a food setting.

Berry and barrel elements are dominant, but black cherry qualities are noticeable. Smoky, toasty notes and vanilla elements are evident along with some earthiness.

In the last few years, limiting crop, increasing sun exposure to fruit, cold pre-soak maceration, low-pressure pressing have made significant quality contributions, and cooperage selection, Vlossak says.

A Pommard clonal selection was planted 13 years ago in the O'Connor Vineyard, the source of a vineyard-designated Pinot Noir.

Winemaking

After a cold soak of four to five days, berries that are 75% broken are inoculated with Epernay II ADY. Juice temperature peaks at 88°F during an eight- to 10-day fermentation in open-top tanks. The cap is punched down daily until thoroughly moist. MLF is uninoculated and completes in barrel.

Pressing is done at cap-fall, and each press load is stopped when tannins begin to taste harsh. Wine clarifies in tank for about a week or two and is transferred to one-third new 90% French and 10% American oak for 17 months. When MLF completes, the first addition of SO_2 at 35ppm is made.

The wine is nitrogen-racked after barrel ageing and the SO_2 is adjusted to 0.5 molecular or 25-30 ppm free, whichever is less. The day before bottling, a single filtration with uncharged pads is made. Wine is released two months later.

Sokol Blosser Winery

Dundee, OR
John Haw, winemaker

Style

John Haw's production goal for Sokol Blosser's three blends is to showcase the essence of Oregon and particularly Yamhill County is the production goal for three blends. "Redland" is a full, heady, and rich wine with fragrant oak sweetness. "Yamhill County" is a lighter, more accessible wine. "Select" offers consumers an affordable drinking experience.

"Redland" is characterized by currants and cassis with hints of leather and tobacco. "Yamhill County" is highlighted by bright cherry and raspberry fruit. Both wines are smooth and lengthy, with raspberry fruit and spice accents.

Over the last few vintages, crop level management, working with new growers, upgrading of stemmer-crusher to a kinder, gentler processing, and a barrel program incorporating barrels from different coopers has boosted quality.

Grapes are sourced from a 16-year-old vineyard in Yamhill County with Pommard, Wädenswil, and Gamay clonal selections.

Winemaking

SO_2 is first added at the crusher at 20 to 25ppm. Depending on the year, five to 15% whole clusters and up to 30% whole berries are inoculated two days post-crush with EC-1118 PDM. The cap is punched down two to three times daily for 20 minutes during a three to five-day fermentation reaching maximum juice temperature of 92°F. The OSU strain is added as inoculum for MLF at 10° Brix.

MLF usually completes in barrel. Pressing is done after a total skin-contact time of 12 to 18 days. Press wine is occasionally added back. One day after pressing, wine is racked to a variety of one- to four-year-old barrels with light lees for 10 to 11 months. In barrel, after MLF completion, free SO_2 is maintained at 20ppm. In some years, the wine is nitrogen-racked once.

If needed, wine is fined with isinglass and racked in three months. Prior to bottling just before the next harvest, wine is given a loose filtration. The Redland lot is only occasionally filtered, most years, not, and is bottle-aged about three years before release.■

VARIETAL REVIEW
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You can contact ***PWV's*** Varietal Review authors, Eleanor and Ray Heald, at: erheald2@aol.com

Creating new wines, NEW opportunities

by Marshall Newman

Seeking ways to enhance its image and keep interest in its wines high, Kenwood Vineyards (Sonoma Valley, CA) recently introduced a bevy of new single vineyard and reserve wines. Based on previous successes, management of the 250,000-case winery identified specialty wines as a niche with considerable untapped potential and expanded its offerings in that area with very satisfying results.

"A winery like ours, that has been in business for 25 years, needs to shake the cage once in a while," observes Vice President Marty Lee. "By taking chances, we're able to keep the attention of wholesalers, retailers, and consumers who otherwise might lose sight of us in the crowd."

Recent performance and projections show the winery adding to its specialty wines folio from a position of strength. Kenwood Vineyards has grown by an average of 15% per year since 1990, and current projections have shipments reaching 300,000 cases annually by the year 2000.

The new limited-production single vineyard and reserve wines — Mazzoni, Nuns Canyon and Upper Weise Zinfandels, Olivet Lane Pinot Noir, Massara Vineyard Merlot and Reserve Sauvignon Blanc — follow in the tradition of Kenwood's Artist Series Cabernet Sauvignon and Jack London Vineyard reds.

Since its introduction with the 1975 vintage, the winery's Artist Series Cabernet has grown to an average annual production of 3,000 cases. Created in 1976, the Jack London Vineyard reds — Cabernet Sauvignon, Zinfandel, Merlot, and Pinot Noir made from fruit grown on the famed author's Sonoma Mountain ranch and bearing a stenciled version of his "Wolf" logo — now top 20,000 cases annually, approximately 12% of winery production.

Kenwood's next entry into this arena began early in the 1990s, when winemaker Mike Lee (Marty's brother) made small lots of Barricia Estate Zinfandel (30 acres of old vines in Sonoma Valley) and Reserve Chardonnay. The two wines served as models for their respective programs, according to Mike Lee.

"For single vineyard, we sought to express the distinctive excellence of that particular vineyard source. For reserve, we selected our best fruit for special winemaking, with the goal of creating a wine with more intensity and complexity than our 'regular' bottling." Released in 1992 and 1993, the two wines garnered good reviews and sold out quickly.

The reception for these wines encouraged Kenwood to broaden single vineyard and reserve production. Massara Vineyard Merlot, from a small, terraced vineyard in the hills above Sonoma Valley, debuted in 1994.

In August of 1995, new Zinfandels were introduced from Mazzoni (a benchland vineyard in Geyserville) and Nuns Canyon (old vines, located at 1,400 feet elevation east of Sonoma Valley in the Mayacamas Mountains), along with Pinot Noir from Olivet Lane (Russian River Valley) and Reserve Sauvignon Blanc, each produced in 1,000 case quantities.

In August of 1996, Kenwood released an Upper Weise Ranch Zinfandel from a 1,000 ft. elevation vineyard on the Mayacamas range in Sonoma Valley.

"The single vineyard wines come from new-to-Kenwood vineyard sources, from which we get fruit under long-term contracts," explains Mike Lee. "We didn't want to lower the quality of our 'regular' blends by taking away key vineyard components, and we wanted continuity on these wines for our distributors and retailers.

"For the Reserve Sauvignon Blanc, I selected a few lots from our two Sauvignon Blanc vineyards for barrel fermentation, malolactic, and so on. It's extremely important that quality stay high in both the 'regular' bottling and the reserve. The reserve will grow in the next two vintages, but it will remain less than 5% of our total Sauvignon Blanc production."

The 1995 releases also introduced special packaging for the single vineyard and reserve products; dark labels and capsules (charcoal for reds, dusky green for whites) with gold foil framing and accents. "At the distributor and retail levels, we wanted these to be easily recognized as unique," says Marty Lee.

These special bottlings are also differentiated by price and market strategy.

"I didn't want them priced too close to our general release wines," continues Marty Lee. "We set the FOB on the single vineyard and reserve releases to get a street price roughly 30% higher. For the single vineyard Zinfandels, the resulting retail is $16 to $20 per bottle. Coincidentally, that's the same price as the Jack London Zinfandel; since the London Zin was sold out when these were released, the price structure made substitution easier."

Both single vineyard and reserve wines are allocated to Kenwood Vineyards' 105 distributors based on each distributorship's sales, except for small amounts reserved for the winery tasting room.

"Natural selection — the limited production, the pricing and the packaging — results in most of the volume being sold to restaurants," Marty Lee observes. "We can't control how each distributor handles its allocation, but distributors use these wines to maximize opportunities with key accounts, and those key accounts are primarily restaurants."

Sales of the latest single vineyard and reserve releases have been strong, but sales are only one of many advantages the winery has realized from the two programs, according to Marty Lee. "They provide Mike and his winemaking staff with new challenges. They give our sales staff and distributors a hot ticket with retailers, and when they get good reviews or good press, they focus consumer attention on Kenwood Vineyards. The success of the single vineyard and reserve wines reflects on the total image of the company and benefits every aspect of our business." ■

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Part III – TASTING AND SENSORY EVALUATION

WHAT, WHEN, AND HOW OF A SENSORY EVALUATION PROGRAM

by Barbara Lindblom

Regardless of its size or resources, any winery can use sensory evaluation to assist production decisions and to improve in-house communications and marketing. Part II of this sensory evaluation series (***PWV*** July/August 1996), discussed the why, where, and who of a sensory evaluation program: establishing specific objectives, appropriate tasting locations, and panels for various kinds of tastings and sensory evaluation. Basic methodology (Part III) follows.

Sensory evaluation techniques and protocols are *what* can be used to accomplish your objectives. Deciding *when* and *how* to best apply these methods and interpret the results are the next steps.

What are the methods?

One aspect of sensory methodology is the use of careful and reliable techniques, such as blind and randomized tasting of carefully prepared samples. Another aspect includes a range of tasting formats, such as discrimination testing, descriptive or analytical tasting, and preference or acceptance testing.

Selection of general methods and techniques, specific tasting design, and details of how to evaluate results, like any part of the process, should be guided by the stated objective of the individual tasting and winery's tasting program.

Sensory evaluation methodology can maximize effective tasting in two ways. It promotes accurate perception and judgement by fostering concentration and by minimizing prejudice and bias. It can also generate more unbiased, reproducible, and recordable results through tasting preparation, design, and format.

Focus

The selected method should help focus tasters' concentration. The tasting process and generating results can be time-consuming and ineffective unless specific objectives are established for the tasting. As Maynard Amerine and Edward Roessler state, ". . . judges often attempt to do too many things at once in sensory evaluation."[1]

A well-designed tasting sheet or even a list of specific objectives can make the process more efficient and effective and reduce the fatigue that diminishes reliability of results.

For example, several wineries have developed tasting sheets specifically for cooperage trials. Individual characteristics of particular interest to the winery in its barrel program are listed on the sheets. Reference standards for those characteristics can be provided. The taster is required to note the intensity of each characteristic. Consequently, his or her concentration is focused, and he or she is "guided" through the process of addressing specific oak-related characteristics.

Minimizing prejudice and bias

Sensory evaluation methods also provide a means to minimize prejudice and bias. Tasting blind, coded, and in randomized order is more important than we normally recognize.

Blind tasting

Even for the most expert taster, knowing or suspecting the identity of the wine interferes with objectivity. Blind tasting removes as many clues as possible and appropriate regarding a specific wine's identity.

A certain degree of information is usually appropriate. Certainly, identifying the type of wine being tasted or the purpose of the tasting is often a necessary part of the process.

Beyond that, there are many ways to ensure a tasting is "blind." The sample bottle identity can be concealed, either by "bagging" or labeling the bottle in a coded manner. Or the wine can also be pre-poured into coded glasses. This coding on the glasses can be placed on the base of the glass so that it is not visible to the taster. The glasses themselves might even be black, or red lighting can be used to avoid the suggestive factor of color if desired.

Sensory evaluation methodology helps diminish other prejudicing factors. For example, with appropriate tasting sheets, precise responses are recorded before the discussion and revelation of wine identity. In this manner, the taster's perception of the wine is more clearly defined and recorded before the interference of other tasters' opinions or the identity of the wine can influence his or her perception.

Randomized tasting order

Randomized order eliminates psychological prejudice resulting from tasting order. The first wine tasted

tends to be preferred.[1] Even when the taster goes back and re-tastes a set of wines in a varying order, the first impressions of the tasting can be psychologically persistent.

Random order also tends to moderate the physiological effects of tasting order. For example, astringency is cumulative (each subsequent wine appears more astringent). On the other hand, sweetness in one wine can accentuate acidity in the subsequent wine.[2]

Certain aromas have particularly fatiguing effects (or are subject to adaptation).[1,2] For example, the first sample of a new oak comparison often appears to have the most toast and vanilla, or the first Gewurztraminer can diminish perceptible varietal character in subsequent samples.

Of particular importance in production tasting is the predicament that defects are among the aromas to which a taster can become easily adapted.

There are some simple ways to ensure at least varied order — such as assigning a different "first" glass to each taster.

Better yet, is a method that staggers ***relative*** order. Glasses are coded on the bottom, so that the identity is concealed from the taster, then the glasses are shuffled. This doesn't ensure true random order, but allows for a variation in tasting order not ordinarily accomplished in production tasting and does so with minimal preparation.

Representative samples

Representative samples are essential for meaningful results. In cooperage trials, it is critical to have enough barrels in a sample to account for normal barrel-to-barrel variation. Based on the standard deviation found in chemical analysis of seven selected oak volatiles evaluated by A. Waterhouse, *et al.*, to obtain wine that has oak volatiles within 30% of the clinical levels of a barrel population, four barrels are required; for 20%, 10 barrels; for 10%, 39 barrels.[3] Although these results are based on chemical analysis and similar work needs to be done on a sensory level, it's clear that a two-barrel *sample* is not necessarily representative, even if the *trial* contains 20 barrels.

Sampling technique is also critical. Ensuring that the previous wine is flushed from the sampling equipment, pulling the sample from a representative location (*e.g.* sample valve), and taking the sample in a manner that does not change the nature of the wine will determine whether or not the tasting results are meaningful.

Treatment of samples, such as trial finings or acidulations, should closely approximate production effects. Reserving control and laboratory-treated samples to taste with "before" and "after" cellar treatment samples will help determine how successfully laboratory trials represent production treatments.

Including duplicate laboratory treatments in trial tastings can help verify whether the difference between possible treatments is greater than the difference between two identical laboratory treatments.

A SENSORY EVALUATION PROGRAM IS MUCH THE SAME AS A STABILITY OR CHEMICAL ANALYSIS.

Other sample factors to be considered are the age and temperature of the samples. If the sample is too old, it is no longer representative. Temperature has a significant effect on the perception of aromas and mouthfeel. According to J. Puisais, in a red wine with high phenol content, a difference of 2°C can result in disagreement regarding tannin levels.[4] Therefore, all wines to be tasted in a group should be at the same temperature — preferably the temperature at which they will be served.

The evolution or development of the wine itself at the time of sampling affects its character. A young wine with high CO_2 will appear more acid and angular and less sweet than it will after the CO_2 level is reduced during cellaring and bottling.

A barrel sample tasted in December after harvest will be different than a sample taken when the wine comes out of barrels. The tasting can be made even more relevant if that sample is set aside and subsequently tasted at the time the bottled wine is released.

Other issues, such as size and shape of tasting glasses and the possible use of control wines for "calibrating" the tasters, will also influence confidence in results. The importance of tasting a set of wines for comparison in glasses of identical size and shape cannot be too strongly stressed.

The timing of tasting also influences how effective a taster will be. Tasting before lunch can give significantly different results than tasting after lunch. Between the interference of what was consumed at lunch and the drop in energy and concentration after a meal, any taster's effectiveness will be compromised.

Types of tastings

A tasting can be a single type or a combination of formats — discrimination, descriptive (analytical), preference (acceptance), and quality assessment. Specific application and design within these procedures depend on the objectives and nature of the tasting. Reproducibility and ease of recording results will depend on the tasting design.

Discrimination tests

Discrimination testing is the process of assessing whether or not there is a difference between samples. It can also include requiring a taster to identify the nature and degree of difference. Such testing might involve assessing the statistical significance between samples. Common formats for this type of evaluation are paired-comparison, triangle, or duo-trio tests.

Descriptive or analytical, tasting

Descriptive or analytical tasting is the process of identifying and assigning descriptors for the sensory characteristics of a wine. Descriptors should be intelligible to everyone, and ideally, reference standards for the descriptors are available. Efforts have been made to standardize descriptive vocabulary with varying success. One successful contribution is the ASEV Wine Aroma Wheel.[5] A practical counterpart for mouthfeel is more elusive, though there have been some developments.[2,6,7] Additionally, there are numerous lists of descriptors and examples of tasting sheets available in the literature.

The tasting design for descriptive analysis can be general (for all wines)

or specific to a project — such as the cooperage comparison process discussed earlier.

A tasting sheet might consist of spaces for the taster to list perceived characteristics under general categories, such as appearance, aroma, and mouthfeel. On the other hand, it might be a form that specifies the characteristics of particular interest, and the taster is required to indicate the relative intensity of each.

Discrimination and descriptive tastings are frequently paired with either preference or quality assessment. The more functions a taster is required to accomplish, the more fatiguing (and possibly confusing) the process can be. Consequently, such combinations are not recommended in classical sensory evaluation methodology because both the purposes and judges can be confused.

However, in practice, two types of results are often desired. In such cases, its preferable to have the tasters complete one "function" (i.e. complete a descriptive evaluation of all of the wines in the flight), then to start "fresh" and retaste the flight for preference or quality assessment. In effect, these should be regarded by the taster as two separate tastings.

Preference tasting

Preference tasting refers to the individual taster's personal preference. This is generally indicated by ranking the wines in a tasting from first to last. In an example of pure preference testing, different wines are presented "blind," and tasting room visitors are asked to identify preferences between different wines.

Relative quality can also be judged by ranking wines in a single tasting based on "overall quality" or in relation to a specified issue.

Assigning scores to each wine that reflect the degree of appreciation or perceived quality is another method that can be applied even to wines that are tasted at different times and in different contexts. Such scores make it possible to compare results for wines tasted at different times.

There are scoring methods based on general ***hedonic*** scales reflecting ***appreciation*** (1 = like extremely, 9 = dislike extremely) or perceived quality, (such as 1 = excellent, 2 = fair, 3 = extremely poor). These are particularly common in consumer testing. The different systems involve a range of total possible points from three to 100. Joel Sidel and Herbert Stone contend that a range of nine appears to have particular practical value in sensory evaluation.[8]

Assigning scores for quality is a very different issue.

What is quality?

Quality assessment is an essential part of winemaking. *If clearly defined*, it can be combined with various sensory evaluation techniques. The difficulty here is the basic crux of sensory evaluation — the problem of assigning objective characteristics to an inherently subjective experience.

Assessment of *absolute* quality is outside the realm of scientific sensory evaluation. *Relative* quality might be assessed if there is precise definition and agreement as to what attributes constitute quality in a particular product.

IT'S IMPORTANT TO BE REALISTIC ABOUT THE . . . DEGREE OF SIGNIFICANCE OF ANY RESULTS.

Such definitions, in order to be reproducible, will apply to particular wine types, for particular markets or audiences. In fact, sensory evaluation methodology is an excellent tool for establishing and assessing such attributes.

Just what constitutes wine quality varies with context. For example, identifiable sensory attributes that define quality in a Chardonnay are different than those for a Cabernet Sauvignon, even if they come from the same vineyard and producer. It's also possible that the attributes that account for quality in either of these wine varieties will differ significantly from the point of view of the individual consumer, wine writer, winemaker, or other judge of quality.

In many regions in Europe, such "standards of quality" are established and recognized. They are basically defined by a long history of market approval (usually based on the price the market will bear), resulting in a consensus of what is "typical," or "correct," for a given wine type in a given region.

What defines quality in one region and wine type does not necessarily transfer between regions and wine types. A typical expert panel from Burgundy asked to evaluate quality in Bordeaux wines is unlikely to repeat the same findings as an expert Bordeaux panel.

For California winemakers, establishment of such quality standards is a more complicated process, because many wine types are produced within and throughout many different regions. Basing market acceptance on decades of sales records is a rather slow process, particularly when sources of grapes and wine styles for any one producer's wine change at the rate they have over the past few decades.

Employing sensory evaluation methodology with consumer testing of targeted markets might speed up this process, particularly if groups of producers within regions joined forces to accomplish such projects. In fact, this methodology is particularly well-suited for identifying markets to target.

Other aspects of the "relative" nature of quality are apparent to the winemaker. In assessing the effects of new barrels on wines, winemakers do not base judgments on the overall balance, quality, and "typicity" of the wine in the new barrel, unless the final product is fermented and/or stored in 100% *new* oak from a *single* source. In most cases, the judgment must be made on what a winemaker believes the wine in a specific barrel will contribute to a blend.

An ideal relationship between quality assessment and sensory evaluation might be as follows: Some individual or group is assigned the responsibility to identify "quality" for a specific wine. The winery then employs sensory evaluation techniques to identify and define the attributes that make up that quality in specific and clearly understood descriptive terms. Thereafter, the winery targets those attributes, again using sensory evaluation techniques to monitor the results.

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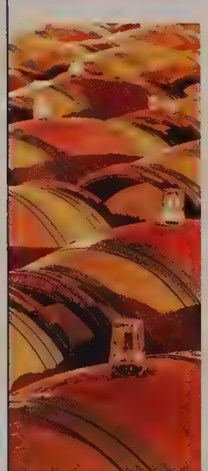

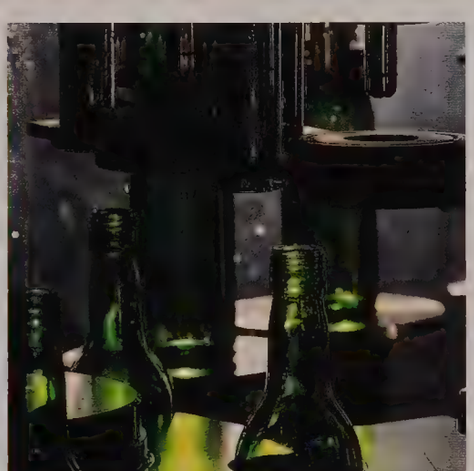

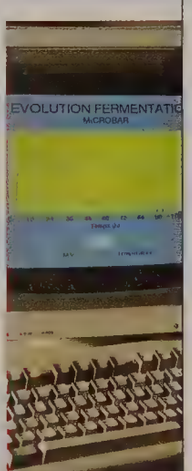

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The real world

One problem with this "ideal" approach in the real world is that interesting attributes are sometimes those which defy definition in terms mutually understood and identifiable by all concerned. Another issue is identifying exactly *who* is to be the arbiter of quality.

Even with a consensus on what defines quality, assessing it requires a significant degree of training and experience on the part of the taster. Currently, the wine industry has no commonly accepted "tests" to assure this degree of expertise.

There are methods which attempt to standardize and objectify general quality assessment such as the Davis 20-point scale. Amerine and Roessler observe that, in using this scale, there are inconsistencies in results unless the score card is used by professionals who are *specifically* trained to use it.[1]

Even with tasters trained to use the score card, they acknowledge that these judges "may have very different standards of excellence for different types of wines. With samples before them, the judges should discuss . . . what range of color will be tolerated in a given type of wine . . . typical varietal aroma . . . and how much fermentation bouquet can be allowed. With respect to these and similar questions the differences between superior and standard wines must be clear to all the judges."

Amerine and Roessler have, in effect, instructed *each* tasting panel to first go through the process of clearly establishing quality parameters in relation to the scorecard for *each* specific wine type to be tasted.

In practice in the wine business, when employing the 20-point scale, the recommended training is rare and establishing quality parameters at each tasting or even for each wine type is almost unheard of. Consequently, most tasters are dissatisfied with their results.

There remains significant and persistent debate over the relevance of any quality scoring method due to the difficulty of establishing concrete (let alone universal) definitions of quality and lack of standardized evaluation of tasters' training and expertise.

Examples of "when" and "how"

An example of employing a combination of discrimination and preference tasting is the program for production trials at Simi Winery (Healdsburg, CA). These particular discrimination tests employ a triangle format.

The members of Simi's tasting panel (see page-38, July/August'96-*PWV*) are given no indication of the nature of the trial or experiment. On a score sheet, they indicate which two wines they find to be the same and state a preference. There is also a section for comments about each wine. However, the results which are recorded for evaluation are the perceived difference and

Continued on page 58

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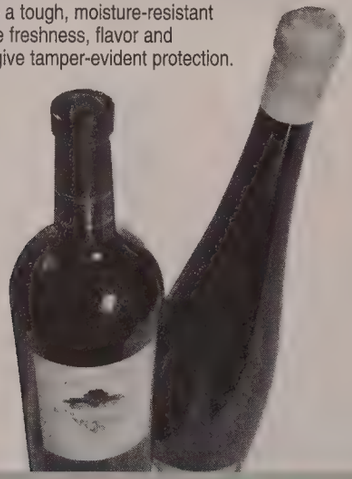
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BLENDING efficiency with tradition in Burgundy

by Laurence Ferar

The village of Prémeaux, in the heart of Burgundy, is home to Domaine de l'Arlot. Its formal gate entrance opens to a gravel courtyard. Within the gray stone building weathered by many years, a time-honored tradition of winemaking is complemented by a modern sense of innovation. Though many American vintners would love to have a winery with the character of an old Burgundian domaine, few would envy trying to make practical use of these venerable buildings.

General manager and winemaker Jean-Pierre de Smet has created a *cuverie* (fermenting room) that is a model of efficiency in a most unlikely space. His creative approach demonstrates a keen awareness of space planning, multi-tasking, and equipment redesign that maximizes productivity without compromising the art of winemaking.

An economy of space

The domaine (like most in Burgundy) is located on the valley floor. Without a sloped site, de Smet works within the confines of the existing structure and still manages to take full advantage of gravity in winemaking. The tank room measures 22-feet wide by 46-feet long. But a 24-foot high ceiling offers the height de Smet needs to make the space work.

A row of fermenters lines each side of a nine-foot wide aisle. On one side, four 50-hectoliter* and two 35-hectoliter fermenters on tall legs allow the press to be loaded directly from bottom doors. On the opposite side, six 80-hectoliter fermenters are set lower to provide clearance for a destemmer mounted above the fermenters.

Overhead, a one-ton hoist on tracks extends the length of the room and serves a variety of functions. Grapes arrive in 500-kg. plastic totes through a door at one

* *Ten hectoliters equal approximately one ton.*

RIGHT: Fermenters on each side of the aisle.

BELOW LEFT: Totes in the specially designed harness are lowered by hoist onto Y-shaped brackets that gently tip grapes into fermenters.

BELOW RIGHT: Arched hose racks provide better drainage and accessibility.

end of the room. The hoist-operator easily maneuvers each tote into a steel harness, and then the tote is lifted onto a pair of specially designed Y-shaped brackets, which gently tip its contents into the fermenter. As each fermenter is filled, the brackets are moved to the next fermenter and the process is repeated.

After primary fermentation, the press is rolled in front of each tall fermenter after it has been drained. The pomace is shoveled into the press and press wine is then gravity-fed into barrels in the cellar below. For the low fermenters, the process is slightly more involved. The support brackets used to load them are suspended over the center aisle. The fermenters are emptied manually into totes. The totes are hoisted, and the pomace gently transferred into the press.

Having all fermenters the same height might simplify the process, but two height levels allow greater flexibility to destem when necessary due to variations in the grapes. In normal years, the winemaker uses 100% whole clusters from mature vines and destems grapes only from young vines. For problem years, such as 1991 and 1994, even grapes from mature vines are 50% destemmed.

Multi-task equipment, smart designs

A square fermenter made of steel or concrete, though rarely used in American wineries, is employed by several winemakers in Burgundy. Without question, this is a more efficient design for limited space. De Smet designed the fermenters with cubic proportions — 2x2x2 meters. He maintains they more closely approximate traditional Burgundian wood fermenters in terms of oxygen contact and the proportion of cap-to-fermenter capacity.

Rather than have the tanks sit idle for 10 months, de Smet employs some of the large ones as bottling tanks. These are fitted with clamped gasketed tops, and nitrogen at low pressure is used to blanket the wine.

The large tanks are also put to good use to refrigerate smaller tanks — by acting like a *bain marie* or double boiler in reverse. Small, round tanks are lowered by hoist into large fermenters filled with chilled water. This ingenious system was devised to accommodate small lots of Romanee St. Vivant from vineyards purchased after the winery was constructed.

The small tanks can also be hoisted for gravity-assisted blending. The hoist comes in handy for cleaning of equipment as well. Once it lifts a destemmer, for example, the underside can be easily pressure-washed.

The winemaker even rethought hose racks for more practical use. A line with a double hook on the end runs through a ceiling-mounted pulley. The double hook fits over the coupler on the end of each hose section, so it can be hoisted easily for drying and storage. Alternately, the middle of the hose can simply be laid over the hook and hoisted. Another hose rack is arch-shaped for better drainage and to keep hose ends accessible.

De Smet credits many of these original concepts to friendly collaboration with Jacques Seysses, owner/wine-

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maker at Domaine Dujac. (In fact, the two wineries share bottling equipment.) But de Smet is justly proud of his refinements for Domaine de l'Arlot.

The Y-shaped brackets, which simplify loading fermenters, enable him to single-handedly perform tasks that would normally require two or more people. Currently, he employs just one other full-time worker in the winery during harvest.

Annual production at Domaine de l'Arlot is about 4,500 cases. Production includes: Grand Cru Romanee Saint Vivant; Nuits Saint Georges 1er Cru (monopoles — Clos des Forets St. Georges, Clos de l'Arlot-rouge, and Clos de l'Arlot-blanc); Vosne Romanee 1er Cru Les Suchots; and Cote de Nuits Villages Clos du Chapeau.

The barrel cellar currently holds about 400 barrels (equivalent to two vintages) and can accommodate up to 800 barrels. The previous owner was a negotiant — buying grapes and wines outside the winery for blending, and ageing them in this large cellar.

De Smet can either heat or cool the fermenters — though not at the same time since they share a common circuit. He typically uses cooling to limit temperature during the middle stages of fermentation. As the rate of fermentation slows, de Smet spreads chapitalization over a five to seven day period. The wine can be heated (to insure fermentation doesn't stop) if the temperature falls below 20°C. Heating is controlled automatically by sensors but cooling is manually controlled to anticipate and allow for fine adjustments.

Domaine de l'Arlot demonstrates that design ingenuity and adaptation can be successfully employed in traditional winemaking. By taking a close look at space planning and equipment capabilities, de Smet has developed a very efficient operation, allowing him more time to concentrate on the art and business of viticulture.

His creative, problem-solving approach to classic winemaking make the tight quarters work year-round without compromising tradition. ■

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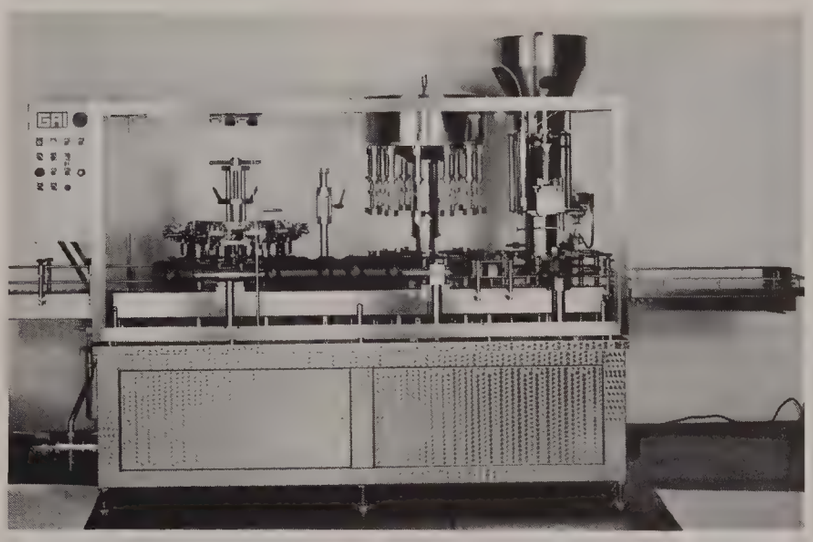

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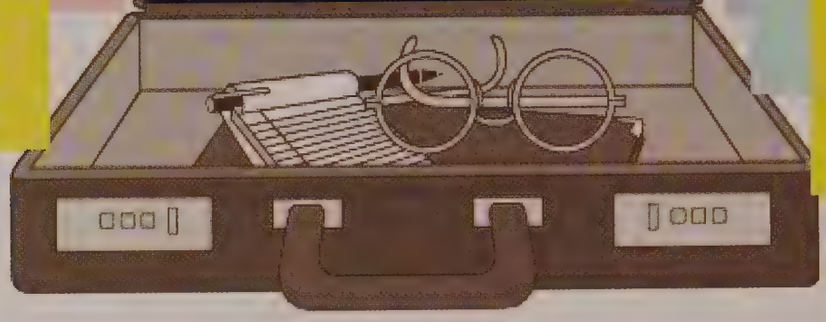

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Grant Thornton's professionals serve the manufacturing and distribution industry from six California offices and more than 45 locations throughout the U.S., and international offices worldwide.

The firm focuses on industry specialization through integrated service teams. Each professional brings a specific expertise, and the team maintains a close alliance while providing sound, objective business advice.

Wine industry experience and a business focus enable Grant Thornton to address issues most relevant to wineries and producers. The firm's extensive use of computer tools brings efficiency to audit compliance and consulting issues; the professionals bring the experience.

As technology revolutionizes the process and government regulation increases, winemakers must be agile and highly responsive while continuing to maintain their customer-driven core values.

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Grant Thornton's Central Valley and greater Bay Area locations allow easy access to the entire wine region of Northern California.

For more information, contact:
Grant Thornton LLP
509 W. Weber Ave., Ste. 300,
Stockton, CA 95203
tel: 209/546-8000; fax: 209/462-3661

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R. Corbin Houchins represents clients ranging from industry leaders to one-person operations throughout the U.S. and in export markets.

Services include: selecting and protecting brand names, package designs, and other intellectual property; legal management of supplier-distributor relationships; negotiating agreements; resolving disputes; and compliance with trade regulation laws.

Houchins has more than 25 years experience in all phases of the wine and

grapegrowing industries, both representing clients directly and acting as adviser to other law firms. Attorneys for industry members are invited to call regarding any matter related to wine or wine grapes.

For more information, contact:
Law offices of R. Corbin Houchins
3150 First Interstate Center
Seattle, WA 98104-4001
tel: 800/962-4805 or 206/343-9597;
fax: 206/223-2045; e-mail RCH5151@msn.com
Please see our ad, page 71.

JOSEPH W. CIATTI CO., INC.

The Joseph W. Ciatti Co., Inc., is the wine industry's oldest, largest, and most comprehensive bulk wine brokerage in the USA and internationally. Annual sales are over 80 million gallons (or 300 million liters) of grape product.

The company offers a full array of wine brokerage services including: grape contracts; grape processing contracts; complete negotiations of bulk wine purchasing and sales; tasting, blending, and finishing wines by on-staff enologists; objective information, such as comprehensive long-term market analysis and evaluation of inventory quality and current market values; and locating unlabeled case goods and unlabeled wine for private labeling.

Ciatti Company has the most extensive and up-to-date product line of premium varietals; generic wines; grape and fruit concentrates; brandy and high proof from grape, citrus, and grain. Internationally, Ciatti offers brokering exports of USA wines to overseas markets and importing foreign wines to California labels and wineries, including wines from Chile, France, Argentina, and other major wine growing regions.

At Joseph W. Ciatti Company, Joe Ciatti, John Ciatti, and Richard de los Reyes specialize in premium Coastal varietals and share responsibility for all California wineries; Greg Livengood and Chris Braun cover the international markets and wineries outside California; and Andy Bivona specializes in grape concentrate, beverage alcohol, and food specialty products.

For more information, contact:
Joseph W. Ciatti Co., Inc.
42 Miller Avenue, Mill Valley, CA 94941
tel: 415/388-8301; fax: 415/388-0528
Please see our ad, page 5.

GOVERNMENT LIAISON SERVICES

Government Liaison Services (GLS) maintains one of the largest and most experienced staffs serving the wine industry. Since 1957, GLS has obtained BATF label approvals along with pursuing BATF rulings on formula submissions, lab analysis results, advertising, and many other BATF matters. GLS also specializes in performing trademark, patent, and copyright search services.

For more information, contact:
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FRED LYON, PHOTOGRAPHER

Fred Lyon is the wine industry's own photographer.

Anyone who has explored the world's famous wine regions has undoubtedly been inspired by Lyon's work in countless publications.

A Napa Valley grapegrower, Lyon maintains the world's most comprehensive and active collection of wine-related photography, **The Lyon International Wine Library**. It spans subjects from planting of vines to enjoyment of wine in the glass; from workers in vineyards and wineries to royalty in the grand salons of Europe; barrels, bottles, glasses, wineries, personalities, lifestyles, and recreation in the winegrowing areas; food, restaurants, and chefs. Many pictures are specific, but a full range of generic subjects is also available.

For wineries and wine marketers, Lyon creates strong, graphic images for persuasive advertising and brochures. This is high-energy photography from an unusual breadth of experience. Complete studio and unique location resources. Service that is friendly, rapid, and reliable. Wine never looked better!

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Motto, Kryla & Fisher (MKF) is a leading firm of wine business consultants and accountants, providing business consulting, accounting, and tax planning services exclusively to wineries and vineyards. MKF is the only such firm devoted exclusively to the premium wine industry.

In addition to their professional experience as CPAs and business consultants, MKF personnel have academic and professional backgrounds in the wine industry. They publish articles, teach, research business issues, and consult with government and trade groups extensively on industry issues.

MKF is active in the legislative process and has been instrumental in drafting legislation affecting the wine industry. The firm has provided testimony to key policymakers and continually monitors proposed and enacted legislation, court cases, and other developments which may have an impact on wineries and vineyards.

As a wine industry specialist, MKF's consulting department offers sale and acquisition services, winery and vineyard business valuations, forecasts and business planning, strategic marketing plans, operations reviews, litigation support, and computer systems and support. MKF also provides many other management consulting services that draw on its industry specialization and expertise. MKF is often involved in an advisory basis in major transactions.

CPAs in the accounting department perform independent audits or reviews of financial statements. MKF financial reports are unique in providing insight into wine business results and trends.

MKF's tax department provides strategies tax planning for wineries and vineyards as well as transaction and individual tax planning. MKF's specialized industry expertise extends to income tax, estate and gift tax, and property tax.

For more information, contact:
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Farella Braun & Martel is an 80-attorney law firm with offices in San Francisco and St. Helena, CA. The firm serves a diverse range of clients, from individual entrepreneurs to multinational public companies, in a variety of industries.

For more than 30 years, Farella Braun & Martel has represented wineries and other businesses and individuals in the wine industry. Among the firm's areas of specialty are commercial litigation, acquisition and development, corporate formation and securities, mortgage and equity financing, environmental and land use, tax and estate planning, real estate and construction, insurance coverage, employment, intellectual property, appellate, and bankruptcy/ creditors'rights.

For more information, contact:
Farella Braun & Martel, LLP
899 Adams St., Ste G, St. Helena, CA 94574
tel: 707/967-4000; fax 707/967-4009
e-mail: fbm@fbm.com; http://www.fbm.com
Please see our ad, page 58.

SCOTT LABORATORIES, INC.

Scott Laboratories offers winemakers a variety of technical materials and services. These products are constantly evolving in order to stay ahead of winemaker need.

Scott's laboratory, which has served the wine industry since 1933, recently installed updated atomic absorption and gas chromatography units. Both are designed to improve efficiency and accuracy. The laboratory runs a complete range of testing and analytical services. Services include wine testing, process consultation and export certification. The laboratory is also certified by the State of California for water analysis.

Enzymes are an evolving part of the Scott program. Over the years, the importance of "side activities" of pectinases has become increasingly evident. This year, Scott is pleased to be introducing a new proprietary series of enzymes with this in mind. Products include pectinases selected for both their primary and their secondary properties (e.g., color extraction, color stability, and filterability). The new line of enzyme is called **Scottzyme**.

In yeast, Scott is particularly pleased with its long-standing (23 years) relationship with Lallemand. This program has now come to include more than two dozen distinct yeasts and four different preparations for malolactic fermentation.

For filtration media, Scott offers the products of Seitz-Filter-Werke. Seitz is the world's premier manufacturer of depth filtration sheets. They run the range from the "K900" (for rough filtrations) to the legendary "EK" (pre-bottling). Scott also offers Seitz pre-membrane and membrane filters.

For more information, contact:
Scott Laboratories, Inc.
2220 Pine View Way, Petaluma, CA 94955
tel: 707/765-6666; fax: 707/765-6674
Scott Laboratories, Ltd.
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HOYT SHEPSTON, INC.

Hoyt Shepston, Inc., has provided the beverage industry with decades of international transportation experience regarding the importation and exportation of beverages and related industry articles.

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Hoyt Shepston has offices in South San Francisco, San Francisco, and Los Angeles and a worldwide web of national and international agents.

For more information, contact:
Hoyt Shepston, Inc.
700 A Dubuque Ave.,
South San Francisco, CA 94080
tel: 800/675-HOYT (4698); fax: 415/634-8066
Please see our ad, page 8.

KAREN KENNY FINE PROPERTIES

Karen Kenny is one of Sonoma County's leading real estate brokers. She began her career in 1977, specializing in selling land and ranches, and has earned the respect of her clients and colleagues in the business. With her enthusiasm and pursuit of detail, Karen brings a depth of knowledge and valuable experience to every transaction.

Karen holds a degree in viticulture from Santa Rosa Junior College. Her professional career includes experience in advertising, publishing, and film production, plus she has been a professional artist. She is a member of the California Association of Winegrape Growers and the Realtors Land Institute. A resident of Healdsburg, she is a recreational triathlete and the owner/broker of her own company, Karen Kenny Fine Properties. She is a licensed real estate broker in California and Oregon.

Combining her knowledge of the market with a keen sense of today's trends. Karen is an innovator in advertising and promotion. As a real estate adviser, she analyzes each client's situation, concentrating on the needs of each individual to engage the right

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For more information, contact:
Karen Kenny Fine Properties
PO Box 846, Healdsburg, CA 95448
tel: 707/433-2700; fax: 707/433-2052
e-mail/web site: http://kkenny.com
Please see our ad, page 63.

PACIFIC COAST FARM CREDIT

Pacific Coast Farm Credit is a locally owned agricultural lending association which is part of the nationwide Farm Credit System established in 1917. Pacific Coast Farm Credit is a cooperative, owned and directed by its members. Because of the association's specialization in agricultural finance, it offers advantages to wine industry customers, including a commitment to agriculture, knowledge of the industry, tailor-made programs, local decision making, and competitive rates.

Understanding the special demands of the wine and vineyard industry, Pacific Coast has programs to finance virtually every aspect of your business. These programs include long, intermediate, and short-term financing and leasing programs.

For more information, contact:
Pacific Coast Farm Credit
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tel: 707/838-4866; fax: 707/838-3456.

DAL POGGETTO & COMPANY, CPAS

Dal Poggetto & Company specializes in tax accounting and consulting services for winery and vineyard businesses and their owners. The firm's partners have been accountants and consultants for the wine industry since 1975.

The firm's services include profit-improvement studies; strategic planning; financial modeling; transaction consulting for mergers, acquisitions, and divestitures; tax strategies and business planning; as well as traditional services such as auditing and accounting, tax planning and preparation, and systems development and consulting.

The staff at Dal Poggetto & Company have extensive wine industry experience and are frequently able to make cost and tax savings recommendations to clients. They have a strong reputation for responsiveness and clear communication skills with clients, as well as excellent technical abilities. The high quality of the firm's practice is maintained by a program of formal technical training for staff which greatly exceeds state licensure requirements as well as the programs of most other accounting firms.

For more information, contact:
John P. Dal Poggetto, CPA
Dal Poggetto & Company, CPAs
149 Stony Circle, Ste 100, Santa Rosa, CA 95401
tel: 707/545-3311; fax: 707/525-3999

COMPLIANCE SYSTEMS OF AMERICA, LLC

Sara Schorske, one of the nation's foremost consultants on alcoholic beverage compliance issues, has terminated operations of Compliance Specialists after 13 years. Compliance Systems of America, LLC, (CSA) is a new consulting company formed under her leadership.

CSA consultants assist growers, producers, wholesalers, and importers in obtaining all approvals necessary to make and sell alcoholic beverages. CSA assists with licensing by resolving zoning obstacles, preparing applications, and expediting timely approvals. In the area of interstate sales, the consultants assist suppliers in making informed decisions about expanding their sales area to include new states and in preparing the required paperwork.

CSA regulatory specialists often perform problem-solving and business-advising functions. They also complete required compliance reports for their clients or train their clients' employees to complete the reports for themselves. Wineries, breweries, and importers can also get assistance with the design of their labels and with obtaining BATF label approvals.

In addition, CSA has a growing relationship with the retail community. The company maintains licenses for chains with multiple locations, assists with the approval of new managers, and processes all the paperwork needed for the acquisition of new retail licenses.

At CSA, their people make the difference, and you can count on them for help with all your compliance needs.

For more information, contact:
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Do you plan to improve your experimental design, but don't want to turn your whole vineyard or winery into a research lab?

If you have a tasting or experimental project or problem, or perhaps an unusual and untried or obscure inspiration you want actualized, call Barbara Lindblom. For 20 years, she has been developing experimental and tasting design, making wine, and working with a wide range of wines, ideas, and people.

Lindblom's objective is to develop customized programs that meet the specific needs and styles of her clients — while seeking to demystify wine tasting and promote sound sensory and experimental practices.

For more information, contact:
Barbara Lindblom
1915 Diamond Ct., Santa Rosa, CA 95448
tel: 707/544-2910; fax: 707/544-3691.

WILLIAM C. KINZLER, ATTORNEY AT LAW

William C. Kinzler started his law practice in 1979 and specializes in matters relating to California's wine industry. The emphasis of his law practice is on alcoholic beverage regulation (state and federal), distribution counseling, business transactions, and start-up companies. His style of practicing law is highly personalized and based upon one-on-one interaction with his clients.

Over the past several years, his law practice has expanded and shifted to meet his clients' needs. For example, during the past year, he has been working with clients to overcome California's restrictive tied-house statutes, so they may diversify and expand their wine businesses to include restaurants, golf courses, retail sales, and importing. His clients include wineries, brand owners, wholesalers, importers, brokers, craft brewers, and companies specializing in the warehousing and transportation of wine.

He is a member of the American Bar Association Alcohol Beverage Practice Committee and the California bar sections on intellectual property and business law.

For more information, contact:
William C. Kinzler, Attorney at Law
100 Pine St., Fl. 21, San Francisco, CA 94111
tel: 415/986-4199; fax: 415/986-4195

HALL & BARTLEY

Hall & Bartley is a full-service architectural firm which specializes in winery design. Founded in 1983, the firm is responsible for the designs of Silverado Vineyards, Michel-Schlumberger, Atlas Peak Vineyards, Kendall-Jackson's Laughlin Road facility, Marimar Torres Estate; and the master planning and/or expansions of Meridian Vineyards, Buena Vista Winery, Turnbull Wine Cellars, Vinwood Winery, Chateau Souverain, and Geyser Peak Winery.

Current projects include "J" master plan, Camp Meeting Ridge Winery, Geyser Peak expansion, Wild Oak Vineyards, and the Jordan Winery Visitors' Center.

Hall & Bartley's services include feasibility studies, master planning, process sizing and flow analysis, architectural design, construction documents preparation, government permitting assistance, construction bidding assistance, and construction administration for new or existing winery projects.

For more information, contact:
Hall & Bartley
4701 Old Redwood Hwy.,
Santa Rosa, CA 95403
tel: 707/544-1642; fax: 707/544-1646
Please see our ad, page 69.

NORDBY CONSTRUCTION

Nordby Construction is a commercial general contractor, licensed in five states, that has served the wine industry for 19 years. A family-owned and operated company with pride in its name, Nordby assists clients in all phases of construction, providing such services as budgeting, cost analysis, value engineering, and scheduling in the pre-construction phases.

In the actual construction phases, the company offers project management and construction services. By being involved from the initial stages of a project to the end, Nordby is able to ensure and maintain a smooth, quality-driven construction project.

In partnership with Nordby Wine Caves, Nordby Construction also designs and builds wine caves.

The recent swing in the construction industry to the use of partnering (design/build) has given Nordby the opportunity to work closely with owners and construction managers as well as architects. The company believes in this approach and recommends it to all its clients. This working-together philosophy eliminates problems before they occur, thus resulting in a higher quality project that does not exceed budget or time constraints. Partnering is by far the most preferred way of construction in today's environment.

NORDBY CONSTRUCTION

Nordby Construction understands what it takes to keep clients coming back. The company's service-oriented attitude and understanding of the team concept are why most current business comes from repeat clients.

For more information, contact:
Craig Nordby
Nordby Construction
3009A Coffey Ln., Santa Rosa, CA 95403
tel: 707/526-4500; fax 707/526-0308
Please see our ad, page 37.

VINQUIRY

What makes a BATF-certified wine laboratory an industry standout? At Vinquiry, clients make no sacrifice for technical excellence. A full selection of high-quality analytical services has always been complemented by a uniquely knowledgeable and accessible staff. In the process of fulfilling the needs of the winemaking community for analysis, solutions to problems, supplies, and equipment, founding partners Marty Bannister and MaryAnn Graf have made this value-added approach a specialty at Vinquiry over its 18 years.

Vinquiry is now also BATF-certified for distilled beverage analysis. Other new services for clients include 4-ethyl phenol analysis, filterability testing, assimilable nitrogen analysis, and photomicroscopy. In addition, Vinquiry is offering Lallzyme EX, a specially-formulated enzyme preparation that improves color stability and enhances mouthfeel in wine.

Analysis panels—groupings of basic tests for defining wine chemistry, evaluating juice, monitoring quality, making decisions about unfiltered wine, and meeting wine export requirements—provide valuable baseline data at savings and convenience to clients.

Vinquiry stocks a comprehensive inventory of glassware, equipment, and supplies used for wine analysis and welcomes special orders. Newly-introduced and highly-demanded

products are regularly added.

In addition to reagents, chemicals, and microbiology supplies, Vinquiry offers a wide range of yeast, both as active-dry and slant cultures, malolactic bacteria, and nutrients for premium wine production. Vinquiry is the exclusive U.S. distributor of the Enoferm line of specialty yeast.

Call or fax for Vinquiry's catalog of services and supplies, or to receive *Vinquiry Report*, a free newsletter.

For more information, contact:
Vinquiry
16003 Healdsburg Ave.,
Healdsburg, CA 95448
tel: 707/433-8869; fax: 707/433-2927.

Please see our ads, pages 33, 46.

GOMBERG, FREDRIKSON & ASSOCIATES

Gomberg, Fredrikson & Associates is a professional consulting, publishing, and winery real estate brokerage company. Founded in 1948, it is California's oldest consulting firm dealing exclusively in wine industry matters. Jon Fredrikson, a former Seagram Wine Company executive vice president, and Eileen Fredrikson, a research specialist, own and operate the company.

A broad range of professional consulting services is offered, particularly emphasizing wine market conditions and industry economics. Typical assignments include: new venture analysis and project management; confidential real estate brokerage for wine properties; acquisitions and divestiture counseling; market positioning and price segmentation analysis; strategic planning; winery and wine inventory evaluations. Clients include many major wine producers, importers and marketers, major financial institutions, and other suppliers of goods and services to the wine trade.

Reporting services include *The Gomberg-Fredrikson Report*, a private wine industry marketing and business report made available only to clients; and the *WINE DATA Wine Pricing Report*, which tracks monthly FOB pricing on 3,000 domestic wines and direct import pricing on 2,500 imports marketed in the U.S.

Gomberg, Fredrikson & Associates' brokerage services deal exclusively in premium winery/vineyard acquisitions and divestitures. Transactions initiated have included: Robert Pepi Winery, Van Beuren Vineyards, Gauer Estate, Vinwood Cellars, Mount Veeder Winery, Whitehall Lane Winery, Tepusquet Vineyards, Conn Creek Winery, Villa Mt. Eden Winery, Pine Ridge Winery, and Stephen Zellerbach Vineyard, among others. The firm is licensed both as real estate and wine brokers.

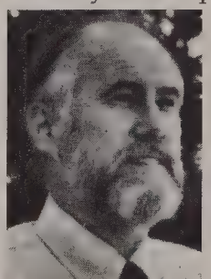
For more information, contact:
Gomberg, Fredrikson, & Associates
703 Market St., Suite 1602,
San Francisco, CA 94103-2126
tel: 415/957-5071; fax: 415/957-5804.

TURRENTINE WINE BROKERAGE

Turrentine Wine Brokerage offers the most efficient way to buy and sell grapes using the Turrentine Grape Exchange System. The company also serves the premium wine business with fast, effective sales of varietal wines in bulk, processing contracts, and pre-season juice contracts. Win/win negotiations, comprehensive selection, over 20 years of experience, U.C. Davis-trained winemaker, and a viticulturist on staff. Ask about the *Turrentine Collateral Value Report* and inventory appraisal service. Also ask about the acclaimed *Market Update* newsletter for in-depth market analysis.

For more information, contact:
Bill Turrentine, Steve Fredricks, or Jim Cartan
Turrentine Wine Brokerage
122 Tunstead Ave., San Anselmo, CA 94960
tel: 415/454-4546; fax: 415/454-9665

STORM ENGINEERING, INC.



Easily developed tracts of land for wineries are becoming very scarce, and as a consequence, the utility systems which must serve them become complex and oftentimes very costly. Water pollution and environmental regulatory compliance, administrative permitting processes, and governmental agency approvals occupy a large part of contemporary design effort that is required to make a winery concept a reality.

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A frequent speaker to industry groups, he presented a paper on North American Distribution and Competition issues to the meeting of the International Wine Lawyers Association (AIDV) in April 1995 in Melbourne, Australia. Since 1990, he has co-sponsored the Wine Industry Symposium (WIS) in California. This October, he will moderate the grape and wine supply/demand session at WIS at Silverado Country Club (Napa, CA).

Ron is an associate member of The Wine Institute (Public Policy committee) and CAWG (his wife is a small grower in Fresno County), and he is a member of the California State Bar Standing Committee on Agribusiness.

For more information, contact:
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TRULA M. LACALLE, PhD

Trula M. LaCalle, LPS, Inc., is a human relations consultant and trainer who specializes in cross-cultural relations with Hispanics. She speaks Spanish and has many years experience in cross-cultural settings, including agriculture. Businesses use her skills in human resource development and the international market, and she has trained non-Hispanics to understand Latinos and communicate with sensitivity toward cultural differences. Along with personal experience as the wife of an Hispanic psychologist, she draws from professional experiences as a Euro-American consulting with immigrant Hispanics and foreign nationals.

She has also helped Hispanics from other nations comprehend and adapt to the U.S. culture and way of doing business.

During 20 years as a licensed psychologist, she has dealt with workplace issues, such as conflict management and resolution, family-owned business conflicts, compliance, motivation, leadership and management styles, trauma, industrial injury, sexual harassment, employee productivity, stress, and personal problems interfering with job performance. In addition, she has hands-on experience in the role of manager/administrator and business owner with 28 employees.

She is a member of the American Society for Training and Development and the American Psychological Association.

Learn more about Trula LaCalle at http://www.LaCalle.com.

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Continued from page 42
preference scores.

The nature of the trial and identity of the samples are revealed while the taster enjoys his, or her, cookie — a double reward. As mentioned before, rewards for tasters are an important part of the process. Simi is not requiring a 5% level of statistical significance for these trials. A Simi test offers something of interest if the majority of the responses are correct.

Discrimination formats do not need to be limited to experimental work. At Matanzas Creek Winery (Santa Rosa, CA), for final fining-trial tastings, winemakers conduct triangle testing for difference and preference between the most preferred fining treatments as well as between the control vs. selected treatments. Because of the subtlety of difference in fining series (and when there is a relatively small tasting panel), triangle testing can be a "voice of reason" in making production decisions that cost time, labor, and materials.

The cooperage comparison format mentioned earlier can be an example of incorporating descriptive tasting with qualitative assessment. The format is designed to be a tool for developing organoleptic profiles of different coopers, barrel treatments, or barrel alternatives, as well as recording quality assessments or preferences. Because the same set of criteria is addressed by all tasters *and* over time, reproducibility of descriptive characteristics and the range of possible applications are improved.

More ambitious formats require greater organization and preparation. But there are tangible results in return for thoughtfully applied techniques.

Interpretation of results

The details of the sensory process, up to this point, will dictate the quality and type of intrepretation possible:

1) Location — If the location is not conducive to good analysis, the results will be less reproducible.

2) Tasters — The tasters' skill, knowledge, and motivation will affect reliability.

3) Techniques — Careful and precise tasting practices produce more significant results.

4) Methods — The tasting and recording methods determine what data will be available for interpretation and evaluation.

It's important to be realistic about the meaning and degree of significance of any results. For example, staggered tasting order may not always be practical. However, the possibility of prejudice or impact of tasting order should be acknowledged. Statistical validation of results shouldn't be implied (or inferred) where it doesn't exist.

On the other hand, many wineries don't bother to address statistical significance, even when it is possible, because of an impression that dealing with statistics is too much trouble. However, there are straightforward tables in various publications which provide information such as the minimum numbers of correct judgments necessary to establish significance (at various probability levels) for various types of tests.[1,8,9,10]

In the end, an individual winery or organization will determine the kind of significance required for any project, and statistical significance may not even be of practical interest. Many descriptive tastings conducted at wineries are not designed for statistical analysis of results.

When fining trials at Matanzas Creek Winery are tasted using a triangle format, the test is not designed to generate statistically significant data. But if the differences are not perceptible to the winemakers, they reconsider the value of the fining.

With or without statistical significance, a good program still requires very specific design and methodology in order to have sufficient meaningful information that can be interpreted and evaluated by other means.

Application of results

Application of any results depends on the objectives, nature of the results, and practical considerations. Possible applications should normally be defined within a stated objective. Changes in winemaking protocol,

purchases, and market presentation or direction (including direction of marketing dollars) may be generated by sensory evaluation projects. The more obvious and tangible the results, the simpler the decisions.

On the other hand, the results may generate no specific changes beyond a greater understanding of the wines, procedures, and market — or greater confidence in the current procedures or direction.

Support

The most important ingredient necessary in developing and maintaining any sensory evaluation program is support within the organization. For a program to be effective, there must be clear and consistent confidence in the value of the program and subsequent support for it. The program simply must make sense to the organization and to all of the key staff involved.

Conclusion

In the wine industry, scientific sensory evaluation will never replace the tradition of expert tasters evaluating wine status, character, and quality. However, keeping in mind basic principles of sensory evaluation (such as the importance of tasting environment, concentration or bias on the part of the taster, selection of tasting format, etc.) will always help to improve a tasting program — no matter how simple or elaborate. Developing expanded tasting support (such as trained panels) and a knowledge of available methodology will provide much greater resources for reliable, reproducible, and useful tasting results.

The range of tools available within sensory evaluation methodology is great, and many of them are surprisingly simple to apply. Which of these tools and approaches a winery will employ in any given situation will depend on the specific "job" and the particular needs, objectives, and resources appropriate to the project. In this sense, it's like any other type of analysis.

Some practices or procedures are simple and have everyday application. Ensuring that production tastings are done blind, in varied tasting order, and with a consistent general format might correspond to analyzing SO_2 or checking barrels for film yeast.

Others are more complex and appropriate only for specific applications. Using a large, trained panel to evaluate and statistically validate the degree and nature of differences within a production trial might correspond to having phenolic profiles run and statistically evaluated on a similar trial.

Developing a sensory evaluation program is much the same as developing a stability or chemical analysis program. There are various procedures and many resources for identifying and selecting a combination of procedures that will work in any given circumstance. The essential first step is defining objectives and then determining appropriate steps to accomplish goals. ■

Barbara Lindblom is a winemaker/consultant specializing in experimental and tasting-related projects for wineries, grapegrowers, and other segments of the wine industry.

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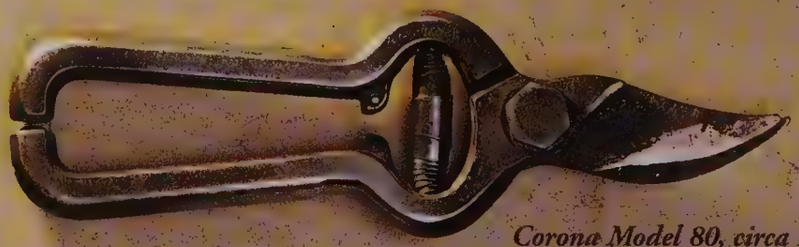

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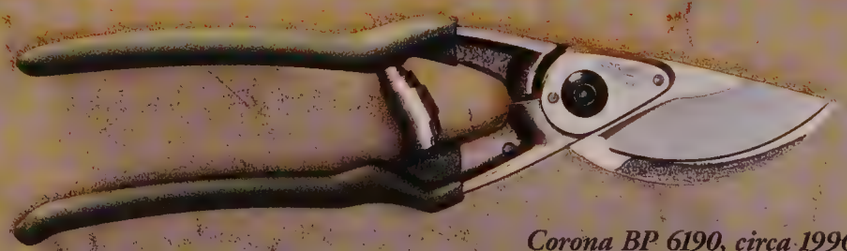

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by Dr. Richard Smart

Cabernet and Chardonnay make way for Shiraz and Verdelho

There are signs in the wine marketplace that the unchallenged reign of Cabernet Sauvignon and Chardonnay may be waning. We have been through a period when these two varieties seemed to be all consumers wanted. Now it seems that they are asking for more variation in what they drink. Surely you have heard the phrase "ABC" — Anything But Cabernet (or Chardonnay)?

For a long time, I have thought we unnecessarily rely on too few varieties for most of our wine production. Which factors make a winegrape variety popular? And which varieties might become popular in the future? I will be really bold and make my forecasts for a red and white variety which will become increasingly popular in the future.

What makes grape varieties popular?

This is an intriguing question, and one we should contemplate more. Some varieties have become so well-known that they are regarded as "classic." For example, in her book, *Vines, Grapes and Wines, the Wine Drinkers Guide to Grape Varieties*, Jancis Robinson lists nine classic varieties, selected for their quantitative as well as qualitative importance. This group contains eight French varieties (Cabernet sauvignon, Pinot noir, Syrah, Merlot, Chardonnay, Semillon, Sauvignon blanc, and Chenin blanc) and one German, Riesling. She further lists 27 "major" varieties, chosen because of their contribution to some of the best known names on the international wine market. These varieties are from France, Spain, Portugal, Italy, and Germany.

For centuries, European wines have been the benchmark for quality, and to me, it is no surprise that French varieties figure so prominently in our thinking. The French people are great marketers. Consider what they have done with wine, food, clothes, perfumes, and cars. Perhaps the French have over-marketed their grape varieties, because now they are planted all over the world!

New vineyards are being planted to the so-called "international varieties," mostly Cabernet, Chardonnay, Merlot, and Sauvignon blanc, whether in Spain, Bulgaria, Chile, California, or Australia, or even as *vin de pays* in the south of France where they were previously banned. Since the French wine industry has now lost its varietal advantage, perhaps that is why *terroir* is being so widely promoted, since that cannot be so readily transplanted! It is one thing to transfer cuttings to another country; another to move a soil and climate!

But there are other reasons why wine grape varieties become classic. Most important, they make good quality and distinctive wine, although some might argue about Robinson's inclusion of Chenin blanc.

Some varieties can produce quality wine across a remarkable range of climates. Of Robinson's classic varieties, I regard Chardonnay as being the most environmentally insensitive, and Pinot noir the most. Chardonnay can produce quality wines from very cool climates, such as Burgundy in France, to very hot ones, such as the Riverland of Australia. (This begs the very important question as to why Chardonnay is not more widely planted in California's Central Valley?)

Pinot noir is the opposite, producing quality wines only in a very small number of discrete regions such as Burgundy; parts of Oregon; Carneros, Russian River, and Santa Maria in California; in the Martinborough district of New Zealand; and the Yarra Valley of Australia. To save offending some readers, I plainly state that this list does not pretend to be exhaustive, but it is deliberately restrictive.

Viticultural attributes are important as well, as varieties also need to be popular with growers to be produced in sufficient volume to make an impact on the market place. Reliable yield is important, probably explaining the relative popularity of Cabernet over Merlot, given the problem fruit set feature of the latter. Is it poor yield which keeps Viognier out of this classical group?

Popular varieties for the growers also offer attractive features, such as fungal disease tolerance or the availability of improved planting material. In this regard, the popular Chardonnay clones of California (FPMS 4 and 5) produce high yields because of large bunch weight. In New Zealand, they prefer the much improved wine quality from the clone with smaller bunches due to many small berries (FPMS 1 or the "Mendoza" clone).

I am sure there are marketing aspects of varieties becoming popular, too. It does help that the varieties have a distinguished European heritage — Cabernet, for example, and the famous wines of Bordeaux. Chardonnay and Pinot noir score well for their use in Burgundy and Champagne.

The variety name should be relatively easy to pronounce and spell, especially in English, and should be easy to memorize. For this reason, I doubt the very widely planted Russian variety Rkatsiteli will ever become popular, despite its ability to produce distinctive wines. It also helps, I think, if the name itself has European language connotations, as with "noir" and "blanc" and "sauvignon" and so on.

Smart tips for the future

If Chardonnay and Cabernet have to move over in the popularity stakes, I think it will be for the French red variety Syrah (or Shiraz as it is called in Australia and South Africa), and for the Portuguese white variety Verdelho. These projections will cause many a raised eyebrow, especially for Verdelho, which is not even included as one of Jancis Robinson's major varieties, and most North American readers will not have heard of it yet.

First, why Shiraz? There is no doubt the variety is capable of making excellent wines, as has been amply demonstrated in the Rhone Valley of France and in many vineyards of Australia and South Africa. A few noteworthy Californian Syrah wines are appearing, and an Australian Shiraz wine, Grange Hermitage, was the 1995 *Wine Spectator* Wine of the Year.

The Shiraz grape can be grown across a wide range of climates, producing in each quite distinctive characteristics. When grown in cooler climates, it produces more pepper characters on the nose and palate. When grown in warm to hot climates, and especially with a little water stress, Syrah

produces mouth-filling warm fruit flavors which respond very well to oak treatment. (American oak is widely used in Australia.)

Syrah wine is softer than Cabernet and normally requires less ageing; Cabernet/Shiraz blends are very popular in Australia. Syrah can also be used to make excellent fortified wines of the tawny and vintage port styles, and even in Australia, is used to make a unique sparkling wine, the so-called "sparkling burgundy," a remarkably fine wine when aged and sought out by connoisseurs in the know.

Syrah is also a good grower's grape variety. Yields are high, and fruit set is reliable. The grapes are easy to hand-harvest with large bunches, but they also machine-harvest readily. The vine is quite vigorous, and the pendant growth habit makes it well-suited to training systems with downward shoot positioning like the Scott Henry, Smart Dyson, and Geneva Double Curtain. Experimental and commercial experience show that fruit exposure is important for quality, even in hot regions.

The readers might find these arguments for Syrah plausible, but why do I nominate Verdelho, a little known Portuguese variety from the small Atlantic island of Madeira? There it is the principal variety used to make the famous sweet wine named for the island, a wine which was important as long ago as the end of the 16th century and known to Shakespeare.

Verdelho is also grown to make table wine in the Dao region of Portugal, but it has really come to my attention in Australia. The single most important reason for my nomination of Verdelho is that, ***like Chardonnay, it produces distinctive quality wines across a wide range of climates.*** Most important, in warm to hot climates, the variety produces distinctively flavored wines with pleasing nose and palate. Similarly distinctive wines are produced in cooler climates. This is an important virtue, which I am not aware that any other white variety can match, apart from Chardonnay. Certainly not Sauvignon blanc, Semillon, or Riesling, or others which come to mind.

Verdelho does not require ageing or oak treatment to be notable and can be bottled and sold within a year of harvest. However, ageing does help develop complexity. Verdelho wine can be blended with other varieties and, obviously, can be made to a sweeter wine style, with or without fortification.

My opinion is shared by quite a few Australian winemakers. While Verdelho is for the moment a minor variety, plantings are rapidly increasing. The variety is easy to grow and yields are moderate. Like Shiraz, the growth habit is pendant, so Verdelho is also well-suited to modern means of canopy management.

The name has a nice ring to it (Sounds sort of Spanish, don't you think?).

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Conclusion

Is it realistic to think that Cabernet and Chardonnay will ever lose their superiority? Perhaps not, but I do think that some other varieties will also become much more important. My tip is that California growers, winemakers, and American consumers will be much, much more familiar with Syrah and Verdelho by the year 2010.

Will these be the only varieties to become more popular? Many people are now promoting Italian varieties like Sangiovese and Nebbiolo, and I think that the Spanish variety Tempranillo is much underrated.

There are many interesting varieties in Portugal, both red and white. Watch out for the reds Touriga Nacional, Trincadeira, and Periquita. Several years ago Peter Bright won the UK-based competition title of International Red Winemaker of the Year with a Periquita wine, brushing all the French varieties aside. As to whites, I think the French variety Semillon is underplanted in California in both hot and warm regions, and that the Rhone variety Marsanne will become more popular.

A note of caution to California growers. Be careful with your planting material, especially for Petite Syrah. This variety has been dogged by mislabeling in California. In the March/April'96 ***PWV***, Professor Carole Meredith reported that ampelographers and DNA testing agree that plantings of this variety might be Syrah, Durif, or even Pinot noir.

FPMS has Shiraz clones from Australia, labeled as clones FPMS 01 through 07; they all originate from one import from Australia in 1970 and differ only in heat treatment, so in fact, might not be different at all. I would suggest using these, and avoid, like the plague, any Petite Syrah planting material. I sincerely hope that the Syrah/Petite Syrah situation will not be the source of naming confusion as has regrettably (and avoidably) happened with so many other varieties in California. Avoid any planting material where there is a doubt about the name.

There also is a FPMS clone 02 Verdelho, originating from the UCD Viticulture selection, of unknown origin. Since these vines have not been verified true to variety, they are not a registered source, and only three vines exist. They have, however, tested free of disease. Perhaps FPMS should have a viticulturist compare these vines with published ampelographies and the vines be registered and multiplied. Someone clever might also introduce the clone used in Australia which performs well in hot climates, as well as pursuing improved clones from Portugal. ■

Dr. Richard Smart, "the flying vine-doctor" is an international viticultural consultant and can be contacted in Australia by fax (011-61-65-84-0121) or e-mail at smartvit@midcoast.com.au. He visits America frequently and can be contacted at Vinquiry in Healdsburg, CA, tel: 707/433-8875.

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by R. Corbin Houchins

Soap Boxes

In the wake of another Supreme Court term, legal analysts are busy gauging the currents of constitutional law.

Messages from the high court display a wide range of clarity and logic, but no opinion this year used plainer or more compelling language than the decision in *44 Liquormart, Inc. v. Rhode Island.* By invalidating a state regulation that prevented price advertising by a state-line liquor market that sought cross-border trade, the justices gave new vitality to First Amendment protection of commercial speech about alcoholic beverages.

Other recent judicial activity, less forthright perhaps than *44 Liquormart*, allayed fears that the government might be able to forbid non-obscene "indecent" speech on the Internet. Indeed, in an era of growing concern about pervasive governmental power and the whittling away of constitutional rights, the judicial waters seem rather benign for those who would like to communicate with their fellow beings about commerce. To some, the courts appear to be giving more protective attention to boxes of soap than to the traditional political soapbox, although the soapbox did pretty well this term when the penalty for political speech was loss of commercial benefits.

It seems time for another look at what one can say about wine, with the additional question whether there is something about the Internet that frees advertisers and wine educators from the restraints regulators attempt to impose on other media.

Bureaucratic Bliss

In *44 Liquormart* the Supreme Court declared that public ignorance is not favored as a regulatory tool.

For those of us who work in an industry where governmental ambivalence about the product has long been expressed by restricting the right to tell people what it is, how much it costs, and where they can buy it, the Court's truism sounds revolutionary. Even though the justices in the majority adopted at least three different analyses, which makes the predictive work of lawyers chancier, the decision makes two other main points that should have profound consequences: The 21st Amendment confers no special powers on government, and the wide discretion courts ordinarily accord regulatory agencies in carrying out beneficial public purposes does not apply to First Amendment cases.

Now that we know retailers may advertise the price of liquor, the big question is, what does it mean for all the other restrictions? Let's begin by reviewing some recent governmental activity in the area.

Last year in *Rubin v. Coors Brewing Co.*, the brewer won the right to describe the alcohol content of its product on a label, absent a better government showing of why not. That case also questioned the old "It's Chinatown, Jake" school of thought, in which the government need only say that it's regulating liquor to justify a restriction. Under the *Rubin* opinion, a regulator must show that the restriction on speech has a direct and material effect toward solving or preventing a stated problem and is tailored to accomplish that goal without unnecessary breadth. When you add the *44 Liquormart* statement that the First Amendment issues are the same whether the 21st Amendment is involved or not, you begin to see a label as a medium of communication that is protected from arbitrary governmental interference. Sounds radical to me.

Of course, it will take some time to discover the implications of the new opinions in situations that are not factually identical. Moreover, cherished habits of mind are not easily changed by abstract concepts like the highest law of the land, so we can anticipate resistance.

In a way, I would miss the entertainment value of the old mind-sets if the new vigor of First Amendment freedom swept them away. Regulatory squabbles employing state power to proscribe certain words on licensed beverage labels can have an operetta duchy flavor, as with the Texas ban on Voodoo beer and the retaliatory Louisiana action against Lone Star.

Of course, all that silliness has real-world economic impact, and assaults on free speech aren't limited to comic figures in obscure liquor agencies. Even the United States Patent & Trademark Office (PTO) gets into the act, by denying trademark registration for Crazy Horse beer on the grounds it is "crass," an objection for which there is no statutory authority.

The Crazy Horse case is a classic First Amendment situation, where the speech involved is something anyone with a lick of sense wishes would go away, but you have to defend it on principle. You don't need a constitution to protect agreeable speech.

Trademark lawyers are waiting to see whether the PTO accepts the Bad Frog brand logo, which depicts a clenched hand with extended middle finger as a beer trademark. Meanwhile, First Amendment lawyers wince, hoping the Bad Frog application doesn't result in an appeal that might restrict constitutional rights on a judge's visceral reaction.

Putting the Question

The legal environment could hardly be better for the clever Wine Institute challenge to the "government warning" mandated by Congress and administered by the Bureau of Alcohol, Tobacco & Firearms (ATF). The hypothetical Wine Institute label would inform the consumer that another governmental agency says other things about wine. If a wine label is a medium of speech, and not just space to be commandeered by the government for a single point of view, then it is difficult to argue that a winery can't refer to contrary viewpoints expressed by the same government.

The government warning is an example of being required to say something that is not a simple disclosure of the truth. The First Amendment issues are different in the more traditional regulatory requirement of mandatory statements whose truthfulness is not in dispute. Nevertheless, interesting questions arise when the disclosure being debated has to do with image and positioning, rather than, say, alcoholic content. A current example arises out of the unceasing war between Anheuser Busch (AB) and Miller Brewing Company.

AB lodged a complaint with ATF about specialty beer advertising and labels that conceal the actual brand owner's corporate identity. The complaint urges the government to require true corporate names on the label, to prevent consumers from falsely believing that the products are handmade or brewed in small batches, when in fact they are prod-

ucts of major brewers or are contract-brewed at mass production facilities for specialty brand marketing companies.

The AB petition, whatever its merits, illustrates the readiness of a regulated industry to call on the regulator to outlaw uncomfortable competition. Restrictions on advertising or changing prices began in the same way and are probably still popular in the licensed beverage industry even after being declared unconstitutional.

In defense of AB, one can point out that the regulatory environment is part of the playing field, and a competitor is entitled to use it to advantage. Universal principles are not the point. AB is a major shareholder in a small brewery with a successful micro-image brand that is marketed with AB's assistance, so I doubt we will see AB petitioning for label disclosure of micro-brew stock ownership, but we may see other brewers using the spin-off or acquisition technique if ATF adopts the rule AB proposes.

Other Media, Other Messages

Nothing in *44 Liquormart* deals with the question whether commercial messages are inherently different when delivered by certain media.

Maryland has a ban on billboard advertising of licensed beverages, currently on appeal, raising the question whether the relative intrusiveness of a medium that can't be turned off (except by refraining from use of the highways) gives the regulators more leeway. (This comes from the same state where one house of the legislature passed a bill that would ban serving wine in the home to family members under legal drinking age. You have to give the enthusiasts of powerful government credit for persistence.)

More complex is the question of new media, especially those that are so chaotic and are developing so rapidly that the regulators can't quite get a handle on them. The prime example is, of course, the Net.

Wine pages on the World Wide Web are more common than weeds in the vineyard, and the volume of commerce they do is significant. Sales through the Internet are no longer to "early adapter" computer freaks, but express the demographic overlap of premium wine buyers and the wired community.

Now that electronic media are a fixture of the wine industry, what are the advertising ground rules? Media lawyers' answers to Internet questions tend to start with "Well, this week . . ." even without factoring in the additional complication of licensed beverages, so all we can try to do here is identify a few of the issues that should be addressed by an industry member's legal advisers.

First, by way of background, the recent court decision saying the government cannot prevent non-obscene "indecent" speech over the Internet is important, but not highly illuminating in the regulated commercial speech area. It allayed fears that creeping governmental power would take away the extension of protected freedoms to media that are difficult to regulate, but does not recognize any right of

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anarchy in new media of communication. Much less does it imply that states' power to regulate commerce in liquor is lessened when the transactions occur over the Internet. My guess is that as commercial importance of the Net grows, the size and amenability to regulation of the access providers will increase, not diminish.

Some questions to answer before committing to a business plan that breaks new ground in communicating with the consumer:

Do reciprocal state bans on advertising apply to Web pages and e-mail transactions? The larger question is the extent to which any state law can regulate the content of what is on the hard disk of a server in another state, access to which is available to an individual in the regulator's state, for a transaction with someone who may be in yet another state. The right of the out-of-state shipper lawfully to send wine into the state is conditional upon refraining from advertising in that state. An argument can be made for the proposition that withdrawing that privilege because a citizen of the state can dial up some useful, truthful text located elsewhere is contrary to current constitutional law.

Do ATF advertising regulations apply to Web page ads? Probably they do. Currently, anyway, I'd be inclined to add the mandatory producer identification and leave off the claims of improved sports prowess for interstate advertising over the Net. Content restrictions based on allegedly controversial scientific claims are a tougher question, but no more difficult on the Net than in other media.

Can a winery attach health-claim articles and references to its Net advertising? First, watch out for copyright infringement. You have to have the right to make a copy of something before you can make it available from your site. The next question is what law applies. Assuming you are complying with ATF regulations, references to titles (as distinct from quoted text of the book or article) probably can't be banned, but text statements that are part of the ad may be regulated. Assuming your legal adviser has cleared the copyright angle, then the interesting question on hypertext jumps to pro-wine scientific text is whether it's part of the ad or a reference. ■

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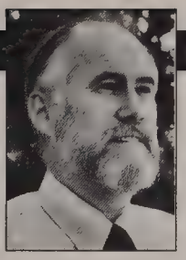

by D.R. Storm, PhD. P.E.

SHOWDOWN AT THE COMPOST PILE

Residential gardeners are a mellow group, showing emotion only when a prize rose is attacked by hordes of aphids or a tomato plant is rendered leafless by a horned-tomato worm.

My city of residence has a very popular program of closing the loop of recycling by offering free compost to its citizens, produced from local landscape "green materials" eco-smartly diverted from the regional sanitary landfill, thus saving space for non-recycables and prolonging the life of the "dump." Nearly 90 tons of the mixed organic waste are eagerly devoured by the city's populace annually from a central stockpile at the city's corporation yard.[1]

It was a rude surprise one day to encounter a fellow compost harvester complaining about the unfair advantage that citizens who own pickup trucks have over lesser-equipped people using assorted, more limited compost-hauling devices, including shopping carts, wheelbarrows, and plain old trash bags.

Several pickup truck drivers, working at the steaming pile, responded that compost gluttony was unlikely because after shovel-loading and unloading a pickup truck of compost, the gardener would be nearly exhausted and incapable of multiple trips (at least on the same day). The congenial mood of the compost recyclers was significantly eroded by a further exchange of barbed comments.

The final assault by this adversarial citizen was a blanket assertion that the assembled truck-equipped shovelers were really landscape contractors, who were using the city's compost largess for personal profit. That was too much for one pickup person, who launched a shovel-full of compost in the direction of the verbal tormenter. What ensued was the equivalent of an Animal House *food fight. Fortunately an ugly compost-pile riot was averted, as the assembled throng "decomposed" into laughter, and tension was relieved.*

In the interest of future harmony among the compost gatherers though, I am going to propose to the city fathers and mothers, that a compost pile "cop" be stationed at the stockpile site to arbitrate any future differences.

INTERNATIONAL STANDARDS ORGANIZATION

European roots sprouting in the U.S.

Part I

History and program description

Nearly 50 years ago, the International Organization for Standards (IOS) was established in Switzerland to stimulate international trade. After a rather lackluster beginning, the IOS — more often called the ISO — published a series of quality control (QC) standards that are advisory in nature in 1987. The standards are written in an ultra-bureaucratic, legalistic style that produces shadowy interpretations for those who are brave enough to grapple with the document. The QC-package is labeled ISO 9000 with four separate sections.[2]

Figure 1
Use of ISO program certification as a marketing tool

ISO 9001

ISO 9001: Encompasses product manufacturers involved with design, production testing, and installation. (A design-build construction company would be a good example.)

ISO 9002: Covers manufacturers that build or fabricate to given plans and specifications. (A cork processing factory fits this category.)

ISO 9003: Covers administrative details of inspection and

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testing for quality control of 9001 and 9002 categories.

ISO 9004: Specifies the internal company audit protocol to guarantee compliance for the 9001 and 9002 categories.

Where does the wine industry fit in?

More and more, recently, I have observed that, in their trade advertisements many non-wine industry companies (and a few wine-related companies) highlight the fact that they have an ISO 9000-certified product.

Figure 1 is an example of how one product-producing corporation used its participation in the ISO program as a marketing tool. Adopting ISO guidelines would seem to be an obvious duplication of programs, with the imposition of an international quality control system on top of a company's in-house quality control program. Where the programs disagreed, one program would have to be subordinate to the other. External forces outside the company structure dictating how a product should be made might not be palatable to senior management officers and to the rank-and-file employees who actually make the product.

Wineries are unique in that their product quality control begins in the vineyard and follows through a series of carefully controlled steps, which may span a period of two or more years, until the end product is deemed ready for sale. It is my view that wholesalers, retailers, and the general wine drinking public (in the U.S. experience, at least) will not have much interest in ISO certification.

They pay greater heed to:

1. The winery's reputation as a purveyor of drinkable wine;
2. The wine buyer's perception of how wine writers and food editors rate wines for quality, price, and marriage with various foods; and
3. Awards from commercial wine judging and competition in both the U.S. and international arena.

Thus, if wine will eventually require an ISO 9000 neck label, for example, to be sold within the European Union, then it will probably be accepted by domestic wineries only as a necessary step to keep a foreign market.

What ISO 9000 has wrought

The adoption of the ISO guidelines requires an *outside* as well as an internal audit to verify compliance. This latter need and the necessity to have someone clearly interpret the hazy verbiage in the rules have spawned a new breed of consultants: certifiers and ISO program trainers and educators.

U.S. wineries haven't made a mad rush to seek ISO certification. Those who are considering it should ponder the following implications:

- Will ISO be like a driver's license? That is, will it establish a minimum level of ability without being able to guarantee quality or produce consistency.
- Will it be another "horrendous" producer of records and paperwork?

Part II of this series will cover an ISO program with an environmental spin; ISO 14000. ■

A consulting civil and sanitary engineer specializing in the planning and design of winery utility systems, David Storm also owns Winters Winery in Winters, CA.

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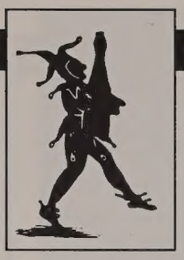

by Jake Lorenzo

Tequila Possibilities

On a gentle, balmy night, Jakelyn's mom and I sit on the fourth floor terrace of the Fiesta Real Hotel in Tepatitlan, Mexico. We overlook the plaza, dominated by the awe-inspiring cathedral. The plaza is teeming with thousands of people dressed to the nines in Mexican fashion. They are here for the *Ferria*, the famous, indescribable *Ferria de Tepa*.

Jakelyn's mom and I are sipping Centinela blanco mixed with Squirt and lime. It's very refreshing and tastes a whole lot better than it sounds. Chuy is six hours late, and I've realized that we probably won't see him until morning.

Suddenly, explosions rip the night. I'm half out of my chair to get Jakelyn's mom under the table, before I realize the fireworks show has started. Rockets shot from the church stairs make percussive "whumps" and explode directly overhead in brilliant colored sparks that drift slowly down until they gently pelt our table with debris.

A spectacular 20 minutes of fireworks blister the night. Rickety bamboo towers light up slowly, then spin faster and faster until they scream their high-pitched whistles and burst into a brightly colored tableau of Christ on the Cross, the Chalice, or *la Patrona de Tepa*. Flaming, screaming carrousels of fire spin ever faster until they lift off like spaceships and sail high into the sky to erupt into golden sparkles, while the church bells clang their approval.

We order another round of drinks. I gaze over the smoke-filled plaza and marvel at this perfect example of religion at the core of Mexican life. Here on the 12th day of the 15-day *Ferria of Tepa*, where tens of thousands of people suck down tequila and cold beers by the bucketful, where throngs of people come from miles around to eat and dance and listen to the hundreds of mariachi bands, the church is the home and the sponsor for the celebration. Fireworks strung from the walls of the cathedral itself, flame into a glowing finale, proclaiming life and religion as integrated parts of the daily Mexican experience.

The party rages throughout the night. Around 3 a.m., we are blasted awake with so dynamic a mariachi horn section, that I check to see if they have somehow crowded into our bathroom. At 5 a.m. sharp, the church bells start ringing. Cannons explode every three seconds for a full five minutes. Nobody, not even Jakelyn's mother, is going to sleep through that.

Thinking about it, it occurs to me that the church is saying, "Well, we're glad you had a good time last night, but today is another day. So, come to church to pray, and then get out and do a day's work, feed your family, and then be sure to come to the party again tonight."

We shower and head down for breakfast where we meet a sheepish Chuy. "Sorry I missed you last night, *carnal*. I got into an extended conversation with *las dos senoritas* pouring at the El Tesoro booth, but I talked the chef into making *chilaquiles*, so we're even. OK?" I don't know if Jakelyn's mom was buying it, but the *chilaquiles* were pretty good.

Chuy had been hanging out at the tequila pavilion. Much like a wine country event, where each winery sets up a table and pours its wine, here in Mexico producers do the same thing with tequila. The tequila booths tend to be more elaborate.

Each booth has two beautiful, young Mexican ladies dressed like beauty pageant contestants even down to the banners across their chests proclaiming Tequila Sauza or Tequila Tapatio instead of Ms. Argentina or Ms. Uruguay. They pour samples of their various tequilas into little plastic shot glasses and, on occasion, extol the virtues of their particular tequila.

It is fascinating to see how much the wine industry and the tequila industry have in common. The key to quality in wine-making is grapes. The key to making fine tequila is agave. Grapes make the best wine when they are fully ripened and mature. Agave makes the best tequila when fully ripened and

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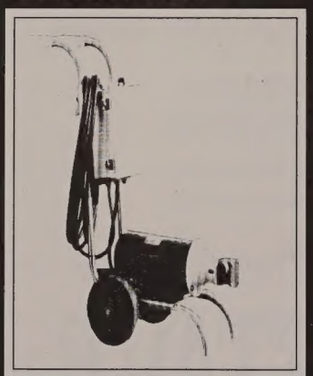

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mature. Grapes are crushed, pressed, and fermented. Agave is first baked in ovens (hornos) to convert starch to sugar, and then it is crushed, mixed with water, and fermented.

Tequila must be made from a specific plant, the blue agave, and the plant must be grown in one of Mexico's designated areas, very much like wine appellations. Spirit made from any other type of agave, or spirit made from the blue agave from a non-designated area, cannot be called tequila.

Tequila, just like wine, is consumed daily by the local people and directly influences the cuisine of the region. Neither wine nor tequila comes with a worm in the bottle.

Not only are there great similarities between wine and tequila production, but the Mexican tequila industry in 1996 looks very much like the California wine industry of 1976:

- Tequila sales are massively (more than 85%) geared to lower quality bulk tequilas used as well pours for making margaritas. In the 1970s, most wine sales were low-end jugs.
- A few large distilleries (Cuervo and Sauza) dominate the market, in much the same way that Gallo dominated the wine market.
- The Romo family pioneered premium, scientific tequila production with their Herradura line of tequila, in much the same way Robert Mondavi revolutionized the premium wine business.
- Many tiny producers making high-quality products have created a whole new premium category, just as the early premium wineries of the 1970s created a new market for wine.
- Excess demand has outrun supply, forcing established fine tequila houses to increase production and creating all sorts of pretenders just in for the fast buck. Think back to the early California wine business.
- Giant corporations are moving in to invest and/or purchase positions, just as Coca Cola, Seagrams, and others did in California.

The parallels between tequila and wine are obvious. What makes tequila unique is that Mexico is the only place that can produce it. Mexico owns it — lock, stock, and barrel down to the last blue agave. They don't have any concerns about California, Australian, South African, or European competition.

Chuy and I are spending a lot of time in Mexico. It is a beautiful, albeit very dusty, country. We would like to see more of a connection between California winemakers and Mexican tequila producers and advise you to come down and see for yourselves.

If you visit, just remember, when in Mexico do as the Mexicanos. You can get wine in Mexico, but you probably won't like it, or you'll find it too expensive for what you're getting. So rather than be disappointed, try tequila and Squirt with lime, or even tequila and Coke with lime. Have it with a plate full of carnitas, some roaring hot sauce, and some steaming corn tortillas. You'll find them a pretty good match. ■

You can write to Jake Lorenzo at
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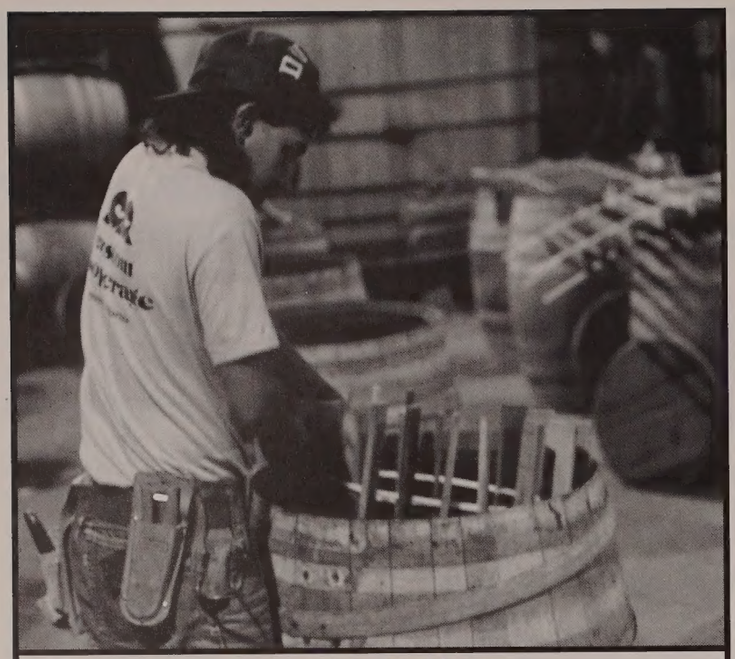

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